The Role of Engagement in a Parenting Intervention for Military Families

A DISSERTATION SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL OF THE UNIVERSITY OF MINNESOTA BY

Ashley Chesmore

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSPOHY

Dr. Abigail Gewirtz

May 2018

Acknowledgements

It is difficult to put into words the gratitude I have for the never-ending support and guidance of my mentors throughout my doctorate journey. Without their encouragement, this dissertation would not be possible. First, I want to acknowledge my advisor, Dr. Abi Gewirtz. Her humor, calming influence, and work ethic inspired me to reach goals I did not think possible – both personally and professionally.

Second, I owe many of my successes to Dr. Lindsey Weiler, who I had the opportunity to work with all four years of my graduate career. She provided endless guidance and feedback in all things research and gave me opportunity after opportunity. Third, I am extremely grateful to Dr. Timothy Piehler for sharing his methodological expertise with me and happily answering my many statistical questions. Fourth, I am appreciative of Dr. Gerald August for introducing me to prevention science and inspiring and mentoring so many young scholars to continue working in this important field. Finally, I would like to thank Dr. Sonya Brady for her thoughtful mentorship during my master's degree in Public Health and for being the first to encourage me to consider a PhD degree.

I would also like to thank my parents, Patricia and Russell Chesmore, who have shown me unconditional love and the meaning of resiliency as they overcame obstacle after obstacle to ensure my dreams were fulfilled. Most importantly, I am indebted to my husband, Brandon – none of this would have been possible without him by my side. I cannot thank him enough for his endless patience, the occasional shoulder to cry on, and his continuous encouragement.

Abstract

Children of recently deployed parents tend to have higher rates of psychosocial difficulties than children of non-deployed parents. Fortunately, evidence-based parenting programs have shown positive child outcomes through improved parenting. The effectiveness of preventive interventions on parenting, however, may vary by military parents' program engagement. Study 1 examined whether baseline levels of parenting, child adjustment, and other family demographics were associated with mother (n = 190) and father (n = 180) program engagement among parents who participated in a randomized controlled trial (RCT) of a parenting intervention designed for military families known as After Deployment: Adaptive Parenting Tools (ADAPT). Important predictors of different forms of mother and father engagement are discussed. Study 2 used complier average causal effects (CACE) analysis to test whether mother (n = 314) and father (n = 294) program engagement (defined as attending 4 or more parenting sessions) was associated with changes in mother and father parental locus of control and observed parenting practices at 12-month follow-up. Findings indicated that mothers and fathers who engaged in the parenting intervention improved in parental locus of control at 12-month follow-up. Mothers, but not fathers, who engaged in the parenting intervention significantly improved in observed parenting at 12-month follow-up. Post-hoc analyses revealed that fathers needed to attend at least 11 session to evince significant improvements in observed parenting practices. Results from these studies will help identify under what conditions military parents benefit from a parenting intervention and may lead to more effectively tailored programs for military families.

Table of Contents

List of Tables

List of Figures

The Role of Engagement in a Parenting Intervention for Military Families

Roughly 40% of the two million United States service members deployed since 2001 are parents (Defense Manpower Data Center, 2015). Service members face substantial challenges because of wartime deployment including exposure to combat-related trauma and/or physical injuries. At-home spouses/partners of deployed service members must cope with the absence of a loved one and the fear and uncertainty for their loved one's safety (Faber, Willerton, Clymer, MacDermid, & Weiss, 2008). Throughout the deployment cycle and upon reintegration, families must cope with transitions in roles and responsibilities within the home environment. Due to the myriad of stressors families face during the deployment cycle, it comes with no surprise that increased posttraumatic stress symptoms among service members and other mental health problems (e.g., depression and substance use) among their spouses or partners continue to be well documented (Jacobson et al., 2008; Mansfield et al., 2010).

Due to the substantial number of stressors that mothers and fathers experience because of wartime deployment, parents' parenting behaviors may become impaired in military families (Gewirtz, Polusny, Erbes, & DeGarmo, 2010). For example, parental distress following deployment has been associated with poor parent-child interactions (Gibbs, Martin, Kupper, & Johnson, 2007), parental stress (Flake, Davis, Johnson, & Middleton, 2009), and poorer self-reported parenting practices (Gewirtz et al., 2010). In turn, impaired parenting increases children's risk for mental health problems including anxiety, depression and substance use (Alfano, Lau, Balderas, Bunnell, & Beidel, 2016).

Theoretical Framework

Social interaction theory (Patterson, Debaryshe, & Ramsey, 1990) provides a theoretical framework to understand how parental distress (in this case, following wartime deployment) may result in poorer parenting practices, and in turn, greater child adjustment problems. Social interaction theory is an expansion of coercion theory which posits that stressful family transitions (e.g., parental deployment) negatively affect parent functioning and family interactions (Patterson et al., 1990). These family interactions may be characterized by low levels of positive communication and high levels of coercive behaviors (e.g., escalation, negative reinforcement). In turn, these coercive interactions may lead to antisocial behaviors among children and adolescents, which are subsequently reinforced by deviant peer group associations (Patterson, 2005). Fortunately, parenting practices are malleable and can be improved with interventions that target positive parenting practices (Forgatch & DeGarmo, 1999; Forgatch & Gewirtz, 2017; Sandler, Schoenfelder, Wolchik, & MacKinnon, 2011).

Theoretically based on social interaction learning theory, the Parent Management Training-Oregon Model (PMTO; Patterson, 2005) has shown success in reducing child adjustment problems through improved parenting including among families experiencing substantial stressors such as divorce (Bullard et al. 2010; Forgatch, Patterson, Degarmo, & Beldavs, 2009). Although parent management training programs have shown strong evidence for their effectiveness across a range of populations (Michelson, Davenport, Dretzke, Barlow, & Day, 2013), until recently, no empirically based parenting programs had been designed to prevent child psychosocial difficulties among school-aged children affected by a parents' deployment. In response to this need, After Deployment: Adaptive Parenting Tools/ADAPT was developed.

After Deployment: Adaptive Parenting Tools (ADAPT)

ADAPT is a prevention program which aims to improve parenting by targeting six parenting behaviors: positive parent-child involvement, skill encouragement, problem-solving, monitoring, effective discipline, and emotion socialization (Gewirtz, Pinna, Hanson, & Brockberg, 2014). Of the 336 National Guard and Reserve families who participated in the study, 60% were randomized to participate in ADAPT and 40% were randomized to a control condition, consisting of online and print parenting resources. Families randomized to the ADAPT program showed improvements in couple parenting behaviors (e.g., positive involvement, monitoring), whereas families assigned to the control condition did not show these changes (Gewirtz, DeGarmo, & Zamir, 2017).

Program Engagement in Parenting Programs

Although findings from ADAPT are promising, program engagement may be a critical source of variability in intervention outcomes. Even among families who successfully enroll and agree to participate in a parenting program, some families will inevitably never attend a single parenting session. Prevention scientists recognize the importance of program engagement and its role in the success of prevention efforts, yet few studies examine predictors of parent engagement and their effects on participant outcomes. Of the studies that have examined engagement in parenting programs, most have shown low rates of attendance and high rates of dropout, often over 50% (Friars & Mellor, 2007). Low rates of engagement may threaten the external validity of research outcomes and make it more difficult to generalize findings to other populations (Garvey, Julion, Fogg, Kratovil, & Gross, 2006).

Although most parent management training programs encourage both mothers and fathers to participate in the parenting programs, they do not require the participation of both. Rather only one parent, typically the mother, participates. For example, studies show that father engagement rates tend to be low, ranging from 13 to 21% (Scourfield, Cheung, & Macdonald, 2014). This is concerning as fathers may play an important role in sustaining intervention effects. Studies show that fathers have a significant impact on their children's well-being and that father involvement may lead to increased parental consistency at home (Bagner, 2013). One meta-analysis showed that relative to studies that did not include fathers, studies that did include fathers reported more positive changes in children's behaviors and parenting practices (Lundahl, Tollefson, Risser, & Lovejoy, 2008). Thus, examining program engagement among fathers may be especially critical, as relative to mothers, knowledge about father engagement in parenting programs is scarce (Panter-Brick et al., 2014).

The Current Studies

The current studies identified important child and parent characteristics that were associated with mothers' and fathers' program engagement (i.e., attendance at face-to-face parenting sessions, home practice completion, and online usage) and assessed how parents' engagement in ADAPT is associated with improvements in mothers' and fathers' parental locus of control and observed parenting practices at 12-month follow-up. The current studies utilized secondary data from ADAPT, a National Institute on Drug Abuse-funded randomized controlled trial of a parenting intervention designed for military families in Minnesota (Gewirtz, et al., 2014).

Study 1: Predictors of Mother and Father Engagement in a Parenting Intervention for Military Families

Parenting programs are promising preventive interventions for improving parenting skills and child emotional and behavioral outcomes (Epstein, Fonnesbeck, Potter, Rizzone, & McPheeters, 2015; Thomas & Zimmer-Gembeck, 2007). For benefits to have a widespread impact, it is imperative that eligible participants actively engage in intervention programing (Spoth, 2008). Research consistently shows a strong link between program engagement and improvements in targeted outcomes (Durlak & DuPre, 2008). Unfortunately, recruitment rates are low, and of the participants who do agree to enroll, many never participate or drop out prematurely. For example, a recent meta-analysis of behavioral parent training programs found that roughly 25% of invited participants do not enroll and an additional 26% of participants drop out over the course of the program (Chacko et al., 2016). These low participation rates are concerning, as parents likely are not sufficiently exposed to the parenting practices needed to alter child behavior (Scott et al., 2010). To enhance program participation and ultimately intervention effects, it is critical that participant characteristics associated with program engagement and barriers to participation are identified.

Understanding what factors are related to greater program engagement among families exposed to unique stressors is needed. For example, studies suggest that families exposed to numerous stressors (e.g., poverty, war) may be more likely to drop out and/or attend fewer sessions (Haggerty et al., 2002). These same families, however, may benefit the most from evidence-based parenting programs (Shelleby & Shaw, 2014).

Military families may face substantial challenges during wartime deployment. This has been true during the conflicts in Iraq and Afghanistan – where families often experience more frequent and longer deployments, many of which involve combat (Hosek, Kavanagh, & Miller, 2006). Because of the many stressors parents face during the deployment cycle, it is not shocking that increased mental health problems (e.g., depression and anxiety) continue to be common among military families (Acion, Ramirez, Jorge, & Arndt, 2013; Gilreath et al., 2013; Jacobson et al., 2008; Mansfield et al., 2010). Because of these findings, a few interventions have recently been designed for military families (Gewirtz et al., 2014; Lester et al., 2012), yet little is known about potential barriers military families may face while participating in such programs.

There is no uniform agreement on the definition of program engagement. A range of definitions have been used to describe participant engagement including the initial reach of a program (i.e., recruitment), attendance at face-to-face and online parenting sessions, within-session engagement assessed by a facilitator, and home practice completion (Berkel, Mauricio, Schoenfelder, & Sandler, 2011). Engagement has been operationalized as face-to-face attendance most often, and is arguably the most necessary antecedent to other indicators of engagement (Piotrowska et al., 2017). There is some evidence, however, that other dimensions of participation including home practice completion, skill use outside of sessions, and quality of engagement as rated by facilitators may predict intervention outcomes above and beyond attendance (Berkel et al., 2016; Nix, Bierman, & McMahon, 2009; Schoenfelder et al., 2013). Therefore, this study examines several aspects of program engagement.

Predictors of Parent Engagement

Demographic characteristics. Single parenthood and socioeconomic status have been found to be commonly associated with participant engagement in parenting interventions. For example, single-parent status has been associated with lower attendance (Baker, Arnold, & Meagher, 2011; Reyno & McGrath, 2006) and lower quality of participation in parenting programs (Dumas, Nissley-Tsiopinis, & Moreland, 2007; Nix et al., 2009). Like single parenthood, socioeconomic status has been linked with lower attendance rates among parents (Winslow, Bonds, Wolchik, Sandler, & Braver, 2009). Although a few studies have found no relationship between socioeconomic status and attendance (Garvey et al., 2006; Nix et al., 2009), a recent meta-analysis found a small but significant relationship between family income and dropping out of parent training programs (Reyno & McGrath, 2006). It is likely that socioeconomic status and single parenthood are linked with logistical challenges such as difficulty finding the time (e.g., inflexible work schedules) and other resources needed for involvement in a parenting intervention.

Child characteristics. Parents who perceive their children to have greater emotional and behavioral difficulties may feel more inclined to participate in a parenting intervention to curb these behaviors relative to parents who perceive their children to exhibit fewer problem behaviors. Several studies provide empirical evidence for this hypothesis showing that parents who report high child maladjustment (e.g., rule-breaking behavior, conduct problems) are more likely to attend parenting workshops than parents who report fewer adjustment problems (Baker et al., 2011; Garvey et al., 2006; Winslow et al., 2009). In contrast, several studies have found no relationship between child behavioral problems and parent attendance (Gross, Julion, & Fogg, 2001; Nix et al.,

2009; Reyno & McGrath, 2006). Child adjustment has also been linked to facilitator-rated program engagement, as one study found that parents who perceived that their child expressed more negative affect, were more likely to increase in their facilitator-rated engagement over time (Coatsworth, Hemady, & George, 2017). These parents may be more motivated to actively participate in parenting sessions.

Parent characteristics. Parents who perceive themselves to be less confident in their ability to parent effectively (i.e., parental efficacy/parental locus of control) may be less likely to attend parenting workshops and more likely to drop out (Chacko, Wymbs, Rajwan, Wymbs, & Feirsen, 2017; Johnston, Mah, & Regambal, 2010). Alternatively, parents with high levels of parenting efficacy may find an intervention focused on parenting behaviors as unnecessary, as there is a strong relationship between perceived need in parenting and rates of participation (Garvey et al., 2006). In addition to parents' perceptions of parental efficacy and/or parental locus of control, several studies have examined observed and/or self-reported parenting skills. Research examining parenting skills in relation to program engagement have been mixed. Some studies show no relationship (Winslow et al., 2009), others show that parents with poorer parenting skills at baseline are more likely to attend parenting sessions (Gorman-Smith et al., 2002), and other studies show that parents using more effective parenting skills at baseline are more likely to attend parenting sessions (Kazdin, Mazurick, & Bass, 1993).

Contextual characteristics. Due to the stressful context surrounding deployment, parent mental health may be a potential barrier to participation. Although several studies have found parent mental health problems such as depression and anxiety to be unrelated to parents' attendance and retention (Baker et al., 2011; Reyno & McGrath, 2006), other

studies have found an association between parents' mental health problems and the quality of their engagement (homework completion, group participation; Baydar, Reid, & Webster-Stratton, 2003; Nix et al., 2009; Schoenfelder et al., 2013). Session content (e.g., discussion of deployment) may cause stress or trigger unwanted feelings among parents with increased mental health problems, which may prevent families from fully engaging in the material. No known studies have examined military deployment in relation to program engagement. However, the length of time service members are away from their families may affect their involvement in a parenting intervention. Parents who are away longer may perceive a greater need to enhance their parenting skills and thus may be more likely to engage in a parenting program. At the same time, these parents may have experienced more mental health symptoms resulting from their combat-exposure and thus may be less likely to continue their engagement over time.

Differences among mothers and fathers

Few studies have looked at the relationship between predictors of program engagement in parenting programs for mothers and fathers separately. This is likely because of the underrepresentation of fathers in parenting interventions (Schock & Gavazzi, 2004), as fathers are far less likely to participate in parenting programs than mothers. A meta-analysis of the parenting program, Triple P, analyzed randomized controlled trials of Triple P and found that only 20% of participants were fathers (Fletcher, Freeman, & Matthey, 2011). Similarly, another meta-analysis of parent management training programs found that only 16 of 32 studies included fathers (Lundahl et al., 2008). To increase the level of engagement of fathers, it is important to identify factors related to fathers' program engagement.

The Current Study

The current study examines which baseline characteristics including demographics, parenting, and child behaviors are associated with mothers' and fathers' attendance, home practice completion, and online engagement in a parenting intervention designed for military families. This research advances the field in two ways. First, this study examines several engagement variables including attendance, home practice, and online usage. This is valuable, as previous research has primarily relied on attendance as the only indicator of parent engagement. Yet, recent research suggests that other indicators may be more predictive of intervention outcomes (Berkel et al., 2016; Nix et al., 2009; Schoenfelder et al., 2013). Second, this study examines predictors of mothers' and fathers' engagement separately. Previous studies have primarily focused on mothers or couple participation, yet there is research to suggest that father involvement is critical to child adjustment (Bagner, 2013), and there may be factors that influence fathers' engagement that are different from factors that influence mothers' engagement.

Due to a greater percentage of fathers in the current study who were deployed and experienced combat-related trauma, it is hypothesized that fathers will engage in fewer intervention sessions, complete fewer home practice assignments, and use the online website less than mothers. Based on previous empirical studies, it is hypothesized that single parenthood, lower household income, lower parental efficacy/locus of control, greater mental health symptoms, poorer baseline parenting practices, and longer deployments will be associated with less program engagement, and parents who report their children to exhibit greater baseline behavioral problems will be more likely to engage in the program.

Methods

Participants

The sample included a subset of families from a larger study of 336 National Guard and Reserve families from a Midwestern state. Families participated in a randomized controlled trial evaluating the effectiveness of a parenting intervention known as After Deployment: Adaptive Parenting Tools (ADAPT). Families were eligible for participation in the study if they had at least one child living with them between the ages of four and 12 and at least one parent who was deployed to the conflicts in Iraq and Afghanistan (Operations Iraqi and Enduring Freedom, and Operation New Dawn; OIF, OEF, OND). Because the current study examines predictors of program engagement, only the families assigned to the intervention condition (N = 207 families; 190 mothers and 180 fathers) were included. Of the 207 families assigned to the intervention, 162 families had two parents participating in the study and 45 families had one parent participating in the study (27 mothers, 18 fathers). Most parents were married (86.7% fathers and 89.5% mothers) and couples were married on average for 9.5 – 9.9 years (mothers and fathers, respectively). On average, most families reported a household income between US $40,000 and $79,999 (40.7%). Parents identified as predominantly European American/White (89.3% of fathers and 93.2% of mothers). Mothers reported a mean age of 35.8 years (SD = 5.7) and fathers reported a mean age of 37.8 years (SD = 6.2). On average, parents reported having 2.24 – 2.29 children (mothers and fathers, respectively). Children (N = 207) were 45.6% girls and 54.4% boys, ages 4 to 13 (M = 8.3, SD = 2.5).

Fathers were deployed in 96.1% of families and mothers were deployed in 17.4% of families. Of the parents who were deployed, fathers were deployed for an average of 1.94 deployments (*SD* = 0.99) and mothers were deployed for an average of 1.35 deployments (*SD* = 0.81). Deployed parents were deployed for 6 months or less (5.2% fathers, 18.2% mothers), 7 to 12 months (25.9% fathers, 36.4% mothers), 13 to 18 months (13.2% fathers, 21.2% mothers), 19 to 24 months (19.5% fathers, 21.2% mothers), 25 to 30 months (11.5% fathers, 0% mothers) 31 to 36 months (12.6% fathers, 3.0% mothers), or 37 months or more (12.1% fathers, 0% mothers).

Procedure

Participants were recruited through several means including the research team's presentations at military-sponsored events (e.g., pre-deployment and reintegration trainings), outreach at military organizations, media outlets (e.g., television, radio advertisements, and online social media), mailings from the local Veteran's Administration Medical Center to OIF/OEF/OND veterans, and word-of-mouth by military parents and stakeholders. Interested families entered the study by completing informed consent through an online website. Eligible parents then completed a confidential online survey and subsequently, an in-home family assessment involving parent(s) and a target child aged 4-12. Staff then contacted the family to inform the parents of the result of randomization and discuss program logistics for those who were randomized to participate in ADAPT's face-to-face parenting sessions. Parenting groups were delivered in parents' geographic area (i.e., optimally within a 30-45-minute drive from their home). If no groups were currently occurring in parents' geographic area, parents were invited to the next available group following their baseline assessment. A

total of seven cohorts of groups were delivered; each group included six to 10 families. Parents were each paid $25 for the completion of the online assessment (up to two parents per family) and each family received $50 for the completion of the in-home assessment. Children were also given a small gift (approximately $1 to $5 in value) for their participation in the in-home assessment. The University of Minnesota's institutional review board approved all the described procedures.

ADAPT Intervention

ADAPT is a modification of the Parent Management Training: Oregon Model (PMTO), a 14-week, group-based preventive intervention. ADAPT aims to improve parenting by targeting the core PMTO parenting practices. These include positive involvement, skill encouragement, problem-solving, monitoring, and effective discipline (Forgatch & Patterson, 2010). In addition to the core PMTO parenting skills, ADAPT adds content relevant to deployment and combat –i.e., coaching on parental emotion regulation and how to respond to and teach children about emotions. Other modifications include mindfulness-based activities throughout the curriculum, special attention to military culture (e.g., examples and videos include military families), and an interactive website to supplement program content being taught in face-to-face sessions. The online component includes supplemental material accompanying the 14 face-to-face sessions such as access to practice videos of families demonstrating and then practicing the core parenting skills with their children, mindfulness exercises, and printable PDF documents summarizing key parenting skills. At the first ADAPT session, parents also receive a binder that includes instructions for the home practice assignments. Facilitators call families between weekly sessions to answer any questions and to provide support for

families, while completing home practice assignments. Parents meet in small groups weekly for 2-hour sessions. During each session, parents practice parenting skills through active teaching methods including role-play, observation, and discussion. Dinner and childcare are offered during each session. Additionally, a $15 gift card is provided to offset the cost of travel. All sessions are delivered by two to three trained facilitators. Facilitators receive 10 days of training on the ADAPT program and coaching sessions every other week, while delivering the intervention.

Measures

Program engagement. Program engagement was assessed using attendance at face-to-face sessions, completion of home practice assignments, and online usage. Participants' attendance at face-to-face sessions was recorded using sign-in sheets and facilitator records. Participants' self-reported whether they completed the home practice assignments at each session. Number of sessions attended (out of 14) and the number of completed home practice assignments (out of 13) were summed to create variables indicating the number of sessions attended and the number of home practice assignments completed. Due to weather (e.g., winter snowstorm) and holidays, in some cases, two sessions were combined into one. Thus, some groups only attended 12 – 13 of the 14 sessions. Parents' online usage was recorded using an online data tracking system. The system assessed the number of times parents clicked on an online component. The total number of clicks was then summed to create a total score.

Cohort. Mothers and fathers were assigned to seven cohorts. Participants in the same cohorts lived in similar geographic locations. Additionally, to encourage participation, participants in cohorts three through seven were entered into a drawing for

a US $25 gift card. Cohorts one through two did not have this opportunity. To account for potential differences in incentives and geographic location, cohort was used as a clustering variable in analyses.

Predictors of mother and father engagement

Demographics. Parents self-reported their marital status at baseline. This variable was coded as 1 (*not married*) and 2 (*married*). Household income was assessed in US dollars in 10,000 dollar increments raging from 1 (*less than $10,000 per year*) to 17 (*$150,000 or more per year*). The target child's age was calculated from the child's date of birth and the child's gender was coded as 1 (*male*) and 2 (*female*).

Parent deployment. Parents self-reported the length of deployment by answering the question: "For the number of deployments that you indicated, what is the total number of months that you were deployed since 2001?" Responses were scored on a scale ranging from 0 (*never deployed*) to 7 (*37 months or more*). Time (in months) since last deployment was assessed by subtracting participant's return date of their most recent deployment from the date of the baseline in-home assessment.

Child behavioral problems. The level of child problem behaviors was assessed at baseline using the widely administered Behavioral Assessment Scale for Children (2nd ed.) – Parent Rating Scale (BASC-2-PRS; Reynolds & Kamphaus, 2004). Due to the age range of the current sample, two versions of the BASC-2-PRS were used: the child form (134 items; normed for ages 6-11) and the adolescent form (150 items; normed ages 12-21). Items were rated on a 4-point scale ranging from 0 (*never*) to 3 (*almost always*). The BASC-2-PRS is used to assess broad domains of externalizing problems, internalizing problems, and adaptive skills. The measure has been found to have good internal

consistency and test-retest reliability (Reynolds & Kamphaus, 2004). The current study utilized the Behavioral Severity Index (BSI) composite, which is comprised of four subscales including aggression, attention problems, depression, and, hyperactivity. Mother and father ratings of child problem behaviors were computed separately. Individual raw scores from both mothers and fathers were then compared to normative data for children of the same age, which resulted in standardized *T* scores (*M* = 50; *SD* = 10). *T* scores were used in all subsequent analyses.

Parent mental health symptoms. Mothers and fathers self-reported mental health symptoms at baseline using the 25-item version of the Hopkins Symptom Checklist (HSCL-25; Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974). The HSCL-25 assesses both anxiety symptoms (10 items) and depression symptoms (15 items). Example items include "feeling low in energy or slowed down" and "suddenly scared for no reason." Items are rated on a 4-point scale ranging from 1 (*not at all*) to 4 (*extremely*). All 25 items were averaged to produce a total symptom score, with higher scores indicating greater psychopathology symptoms. Reliability was good for both mothers and fathers (α = .93 and .95, respectively).

Parent locus of control. Mother and father locus of control was assessed at baseline with the Parental Locus of Control Scale (PLOC; Campis, Lyman, & Prentice-Dunn, 1986). The PLOC includes 24-items, which assessed parenting control orientation across four dimensions including parental efficacy (e.g., "My child usually ends up getting his way or her way, so why try"), parental responsibility (e.g., "My child's behavior problems are no one's fault but my own"), children's control of parents' life (e.g., "My child influences the number of friends I have"), and parental control of

children's behavior (e.g., "My child's behavior is sometimes more than I can handle"). The original PLOC included 47 items, but was shortened to 24 by selecting items from each subscale that had the highest factor loadings in the original study (Hassall, Rose, & McDonald, 2005). Parents rated items on a 5-point Likert scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). A total mean score was obtained for mothers and fathers. Scores were reversed coded such that higher scores indicated higher locus of parental control in participants' ability to parent his or her child. Internal reliability was adequate for both mothers and fathers, $\alpha = .73$ and $\alpha = .71$, respectively.

Effective parenting practices. Mothers' and fathers' effective parenting was measured at baseline with five indicators: (1) problem solving, (2) encouragement, (3) monitoring, (4) harsh discipline, and (5) positive involvement. Scores on each indicator were obtained from observation of parent-child interactions during structured family interaction tasks (FITs). The FITs included seven videotaped parent-child interactions centered on problem solving, discussion of conflicts, monitoring, and teaching. Combined, all FITs took 40 to 60 minutes to complete. Trained coders, who were blind to intervention status, scored the FITs using the Coder Impressions System (Forgatch, Knutson, & Mayne, 1992). Prior studies indicate that the FITs scales demonstrate good construct validity (Forgatch & DeGarmo, 1999) and inter-coder correlations were high for all subscales (ICCs ranging from .78 to .88). Items for each scale were then averaged together separately for mothers and fathers to create an overall mean score of effective parenting. Higher scores indicated more effective parenting skills.

Participant satisfaction. Mother and father satisfaction with the ADAPT program was assessed with a 20-item survey. The survey was developed by Forgatch

(1994) for PMTO interventions, and modified for the ADAPT program (Gewirtz et al., 2014). Factor analyses of the full scale revealed three factors: participant satisfaction, participant satisfaction with the group experience, and home practice satisfaction (Pinna, Hanson, Zhang, & Gewirtz, 2017). The mean of the first two factors was used in the current study to assess participants' overall satisfaction at the first session they attended; higher scores indicated higher overall satisfaction. Items included agreed with ideas, information presented today was helpful, enjoyed group, facilitators were encouraging, felt open, active participation, felt accepted by other group members, pleasantly humorous things happened, I paid careful attention, understood by facilitators, and like the facilitators. Items were assessed using a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*very much*). The third factor, home practice satisfaction, was not included because participants did not have the opportunity to evaluate their experience with home practice until the second session. Surveys were placed in the participant binders in advance of the first group and were pre-labeled with confidential participant identification numbers. Facilitators asked participants to complete surveys at the end of each group session. Parents then placed the surveys into an envelope to maintain anonymity. Internal reliability was good for both mothers and fathers, $\alpha = .77$ and $\alpha = .83$, respectively.

Analysis

Descriptive statistics including means, standard deviations, and bivariate correlations were computed to assess the distribution and relation among all study variables. Prior to all analyses, the normality of the parent engagement variables was examined using SPSS version 22. It was found that each of these variables violated

normality assumptions and exhibited significant positive skewness. All distributions were zero inflated, which challenges assumptions underlying frequently used statistical techniques such as linear regression. Past studies have tried to deal with this pattern of data by focusing only on participants who attended at least one session or more. This approach; however, fails to account for the observed distribution and does not separately evaluate whether distinct predictors are associated with those participants who attended no sessions versus those participants who attended an increasing number of sessions. Given the non-normal, zero-inflated distribution, six count-based models were considered to determine the appropriate model for the data. These included Poisson regression, negative binomial regression, zero-inflated Poisson (ZIP) regression, zero-inflated negative binomial (ZINB) regression, hurdle Poisson regression, and hurdle negative binomial regression.

Poisson and negative binomial models were considered because they can account for count data and non-normal distributions. The Poisson regression model uses a Poisson distribution as its probability model and assumes that the conditional mean is equal to the conditional variance (Mullahy, 1986). Count data, however, are often characterized by overdispersion (i.e., the variance exceeds the mean). In cases of overdispersion, the Poisson model may be inadequate and a negative binomial model may be more appropriate, as this model allows for the variance to exceed the mean with the inclusion of a dispersion parameter, *k* (Cameron & Trivedi, 1998). ZIP, ZINB, and hurdle (Poisson and negative binomial) models were also considered due to the preponderance of zeros, as there was a good proportion of fathers and mothers who never attended parenting sessions, never completed home practice assignments, and/or never engaged with

ADAPT's online platform. Zero-inflated and hurdle models fit two simultaneous models: a logistic regression which predicts the probability of being in the zero group (e.g., not attending a single parenting session) and a Poisson or negative binomial regression which predicts the frequency of sessions attended, home practice completed, and/or online usage (Rose, Martin, Wannemuehler, & Plikaytis, 2006). Hurdle models differ from zero-inflated models because they assume the zeros are generated from one process, rather than two processes, as in ZIP and ZINB models. The ZIP and ZINB models predict excess zeros, whereas hurdle models include all zeros in the first part of the model (i.e., logistic model). The second part of the ZIP and ZINB models may contain zero counts, but the second part of the hurdle model only includes non-zero, positive counts (Rose et al., 2006).

To determine the appropriate models for interpretation, several fit indices were assessed including the log-likelihood, the Akaike Information Criterion (AIC), and the Adjusted Bayesian Information Criterion (ABIC). Smaller values mean a better fitting model. The log-likelihood value can be used to conduct a log-likelihood ratio test to compare the fit of models. However, the log-likelihood ratio test is only appropriate for comparing nested models whereas the AIC and ABIC are appropriate for comparing both nested and non-nested models. The following models were nested: Poisson is nested within negative binomial, ZIP is nested within ZINB, Poisson is nested within hurdle Poisson, and negative binomial is nested within hurdle negative binomial. The dispersion parameter, *k*, is the only factor that distinguishes the nested models, and thus can also be used to compare models. If the parameter, *k* is significant, there is significant

overdispersion and the negative binomial, ZINB, or hurdle negative binomial model should be used.

All models were specified in Mplus version 8 (Muthén & Muthén, 1998-2017). Child gender, child age, child behavioral problems, marital status, household income, number of months parents were deployed, time since last deployment, parent mental health symptoms, parent locus of control, effective parenting, and satisfaction at first session attended all served as potential predictors of mother and father attendance, home practice completion, and online usage. Time since last deployment was included in models predicting fathers' engagement only, as too few mothers were deployed (n = 34), resulting in 81.1% of mothers with missing data on this variable. The variable, satisfaction at first session attended, was only allowed to predict the Poisson or negative binomial part of the two-part models (i.e., hurdle, ZIP, ZINB). Because parents participated in the ADAPT study in cohorts (e.g., groups of families in similar geographic locations), the potential effect of clustering was accounted for by using the TYPE = COMPLEX with CLUSTER = Cohort function in Mplus. Odds ratio (*OR*), incident risk ratios (*RR*), standard errors, and *p*-values were reported for the analyses.

Missing data. A missing-value analysis was conducted using SPSS version 22. The percentage of missing data on mothers' variables ranged from 0% to 24%. The Little's MCAR test was conducted on all measures and showed that the pattern of missing values was missing completely at random among mother study variables, χ^2 (104) = 110.9, $p > .05$. The percentage of missing data on fathers' variables ranged from 0% to 31%. Little's MCAR test, however, showed that the pattern of missing values among father study variables was not missing completely at random, χ^2 (122) = 165.3, *p*

< .01. A missingness variable was created by summing the number of missing values for each participant. The missingness variable was significantly correlated with child age, cohort, and marital status. Therefore, the missing data pattern was likely missing at random (MAR) and with the inclusion of the predictor variables of missingness, it is feasible that full information maximum likelihood (FIML) can address our missing data. FIML estimation was used to estimate missing data in each of the models. FIML selects the parameter estimates using all available data and is preferred over other methods for dealing with missing data (e.g., listwise deletion; Johnson & Young, 2011).

Results

Descriptive statistics and normality tests revealed fathers' ($W = .87$, $p < .001$) and mothers' ($W = .86$, $p < .001$) attendance at face-to-face sessions was not normally distributed. On average, fathers attended 5.80 parenting sessions ($SD = 5.0$) and mothers attended 6.62 parenting sessions ($SD = 5.07$). Fifty-four (30.0%) fathers did not attend any parenting sessions and forty-five (23.7%) mothers did not attend any parenting sessions (See Figure 1.1 and 1.2). A paired sample *t*-test ($n = 162$ couples) indicated that mothers ($M = 5.19$, $SD = 0.41$) attended significantly more parenting sessions than fathers ($M = 4.96$, $SD = 0.39$), $t(162) = 2.58$, $p = .011$.

Fathers' ($W = .85$, $p < .001$) and mothers' home practice ($W = .88$, $p < .001$) variables also were not normally distributed. On average, fathers completed 4.67 home practice assignments ($SD = 4.40$) and mothers completed 5.51 home practice assignments ($SD = 4.55$). Sixty-four (35.6%) fathers did not complete any home practice assignments and fifty-two (28.4%) mothers did not complete any home practice assignments (See Figure 1.3 and 1.4). A paired sample *t*-test ($n = 162$) indicated that mothers ($M = 4.69$,

SD = 0.37) completed significantly more home practice assignments than fathers (*M* = 4.42, *SD* = 0.35), *t*(162) = 2.76, *p* = .006.

Fathers' (*W* = .68, *p* < .001) and mothers' online usage (*W* = .78, *p* < .001) variables were also not normally distributed. On average, fathers clicked on online components 17 times (*SD* = 23.6) and mothers clicked on online components 23.1 times (*SD* = 30.0). One hundred and two (56.7%) fathers did not access the ADAPT online platform and seventy-three (38.4%) mothers did not access ADAPT's online platform (See Figure 1.5 and 1.6). A paired sample *t*-test (*n* = 162) indicated that mothers (*M* = 22.9, *SD* = 23.9) clicked on online components significantly more than fathers (*M* = 16.4, *SD* = 23.2), *t*(162) = -2.85, *p* = .005.

Means, standard deviations, and bivariate correlations for fathers' and mothers' study variables are presented in Table 1.1 and Table 1.2. Fathers' attendance was positively correlated with home practice completion (*r* = .95, *p* < .001) and online usage (*r* = .41, *p* < .001). Fathers' attendance was positively correlated with fathers' report of greater child behavioral problems (*r* = .17, *p* < .05) and less effective observed parenting at baseline (*r* = -.19, *p* < .05). Fathers' home practice completion was only correlated with fathers' exhibiting less effective observed parenting at baseline (*r* = -.18, *p* < .05). Fathers' online usage was unrelated to any of the study variables. Mothers' attendance was positively correlated with home practice completion (*r* = .96, *p* < .001) and online usage (*r* = .43, *p* < .001). Mothers' attendance was positively correlated with mothers' satisfaction at the first parenting session attended (*r* = .24, *p* < .01). Mothers' attendance was negatively correlated with child age (*r* = -.18, *p* < .05) and parental locus of control (*r* = -.16, *p* < .05). Mothers' home practice was positively correlated with mothers'

satisfaction at the first parenting session attended (r = .23, p < .05) and negatively correlated with child age (r = -.18, p < .05). Mothers' online usage was only correlated with child age (r = -.18, p < .05).

Fit indices and comparison of models are presented in Table 1.3. The log-likelihood, AIC and ABIC fit indices show that the ZINB and the hurdle negative binomial models are superior to all other models (i.e., Poisson, negative binomial, ZIP, hurdle Poisson), as these models had the smallest values. The dispersion parameters were significant, indicating overdispersion was present and confirmed the need for the use of the negative binomial distribution over a Poisson distribution. The differences between the ZINB and hurdle negative binomial models were marginal (e.g., 0.1). Because the fit indices were indistinguishable between the ZINB and hurdle negative binomial models, the hurdle negative binomial model was chosen because it is believed that there may be distinct predictors that are associated with parents' likelihood of attending one or more sessions and the frequency of sessions attended (i.e., frequency of home practice assignments completed, online usage). The hurdle negative binomial models are more appropriate based on this hypothesis because zeros are not included in the second part of the model, rather only positive integers are included.

Father attendance. Results from the first step of the hurdle negative binomial model predicting the *odds of fathers completing at least parenting session* is presented in the first column in Table 1.4. Results indicated that fathers who reported greater household income (*OR* = 1.20, p = .028) and longer deployments (*OR* = 1.21, p = .025) had higher odds of attending at least one parenting session. Fathers who were observed at baseline to exhibit more effective parenting skills had lower odds of attending at least

parenting session (*OR* = .63, *p* = .000). Results from the second step of the model predicting the *number of parenting sessions fathers attended* are found in the second column of Table 1.4. Results showed that fathers' report of greater child behavioral problems was associated with attending more parenting sessions (*RR* = 2.04, *p* = .002).

Father home practice. Results from the first step of the hurdle negative binomial model predicting the *odds of fathers completing at least one home practice assignment* is presented in the first column in Table 1.5. Child age was significantly associated with the odds of completing at least one home practice assignment, such that the older the child the less odds the father will complete at least one assignment (*OR* = 0.77, *p* = .003). Fathers who were observed to exhibit greater parenting skills at baseline had lower odds of completing at least one home practice assignment (*OR* = .71, *p* = .000). Results from the second step of the model predicting the *number of home practice assignments fathers completed* are found in the second column of Table 1.5. Only the number of months fathers were deployed was significantly associated with the number of assignments completed (*RR* = .78, *p* = .000).

Father online usage. Results from the first step of the hurdle negative binomial model predicting the *odds of fathers clicking on the ADAPT website at least once* is presented in the first column in Table 1.6. None of the predictor variables were associated with fathers' odds of clicking on the website at least once. Results from the second step of the model predicting the *number of times fathers click on the ADAPT website* are found in the second column of Table 1.6. Single fathers (*RR* = 0.62, *p* = .015) and fathers with older children (*RR* = 1.88, *p* = .001) had greater online usage.

Mother attendance. Results from the first step of the hurdle negative binomial model predicting the *odds of mothers attending at least one parenting session* is presented in the first column in Table 1.7. Mothers who reported more mental health symptoms (*OR* = .85, *p* =.012) and mothers who reported greater parental locus of control (*OR* = .81, *p* = .001) had lower odds of attending at least one parenting session. Results from the second step of the model predicting the *number of parenting sessions mothers attended* are found in the second column of Table 1.7. Only mothers' satisfaction at the first session attended was significantly associated with the number of sessions mothers attended (*RR* = 2.13, *p* = .000).

Mother home practice. Results from the first step of the hurdle negative binomial model predicting the *odds of mothers completing at least one home practice assignment* is presented in the first column in Table 1.8. Child age was associated with lower odds of completing at least one home practice assignment, such that mothers with older children had lower odds of completing at least one home practice assignment (*OR* = .78, *p* = .029). Mothers' who reported more mental health symptoms (*OR* = .84, *p* = .018) and mothers who reported greater parental locus of control had lower odds of completing at least one home practice assignment (*OR* = .75, *p* = .008). Results from the second step of the model predicting the *number of home practice assignments mothers completed* are found in the second column of Table 1.8. Mothers who reported being married were more likely to complete more home practice assignments (*RR* = 1.64, *p* = .023). Mothers who were observed at baseline to exhibit more effective parenting practice and mothers who reported greater satisfaction at the first parenting session attended were more likely to

complete a greater number of home practice assignments (*RR* = 1.37, *p* = .047 and *RR* = 2.08, *p* = .002, respectively).

Mothers' online usage. Results from the first step of the hurdle negative binomial model predicting the *odds of mothers clicking on the ADAPT website at least once* is presented in the first column in Table 1.9. Mothers who reported greater parental locus of control had lower odds of clicking on the ADAPT website at least once (*OR* = .78, *p* = .001). Results from the second step of the model predicting the *number of times mothers click on the ADAPT website* are found in the second column of Table 1.9. Single mothers were more likely to use the online platform relative to married mothers (*RR* = .70, *p* =.046).

Discussion

It was found that fathers attended fewer sessions, completed fewer home practice assignments, and used the online platform less often than mothers. This may explain why fathers did not appear to benefit from the ADAPT program to the same degree as mothers, as intent-to-treat findings indicated that fathers only marginally improved in parenting practices at 12-month follow-up, whereas mothers significantly improved (Gewirtz & DeGarmo, 2014). Although it is likely that there are some cross-over effects, such that fathers may still benefit when their partners participate in parenting programming, it is useful for preventive interventions to find ways to bolster father participation. Previous research shows that children may derive greater benefits when both mothers and fathers are involved (Bagner, 2013; Lundahl et al., 2008). Examining predictors of program engagement among fathers may provide some insight on how to increase father participation in parent training programs.

Predictors of Session Attendance

Predictors of fathers' attendance. Fathers who were deployed longer (in months) had greater odds of attending at least one parenting session. Although marginal, the second part of the hurdle model indicated that fathers who were deployed longer attended a fewer number of sessions. These findings suggest that military fathers' length of time away from their child(ren) is an important factor in fathers' decision to participate in a parenting program. Fathers who have been away longer from their child(ren) may feel that they could benefit more from participating in a parenting program. For example, a qualitative study found that fathers felt that they had trouble reconnecting with their child post-deployment and many felt they missed important developmental milestones while away from their child(ren) (Walsh et al., 2014). Fathers may feel that participating in a parenting program is an opportunity to reconnect with their child(ren) following deployment. It is unclear why fathers deployed for a greater number of months were not also likely to attend more sessions over all. Fathers who were deployed longer were exposed to more combat-related stressors. Perhaps, fathers found it difficult to discuss their deployment experiences at parenting sessions and thus were less likely to attend a greater number of sessions.

Although child care and transportation were provided in the current study to eliminate potential barriers to participation for families with lower socioeconomic well-being, fathers' lower household income was associated with lower odds of attending at least one parenting session. This finding is consistent with past literature that has consistently found a link between lower socioeconomic well-being and lower rates of attendance (Reyno & McGrath, 2006; Winslow, 2009). Studies have commonly found

that logistical issues related to program participation (e.g., shift work, less work flexibility, transportation) prevent lower-income families from participating in parenting programs (Gross, Julion, & Fogg, 2001; Mendez, Carpenter, LaForett, & Cohen, 2009). Fathers with lower household incomes may have been less likely to choose to participate in ADAPT because they felt that they did not have time and/or the flexibility to do so. Programs may find it useful to discuss any potential barriers fathers may feel would prevent them from participating prior to enrollment. This would give staff an opportunity to address any of these types of logistical concerns and ensure that parents are aware of resources ADAPT provides (e.g., child care, transportation) that may encourage participation.

Fathers who were observed at baseline to exhibit less effective parenting practices had greater odds of attending at least one session. This finding from the first part of the hurdle model may be encouraging, as it suggests that fathers who may have been at higher-risk for using coercive forms of parenting were more likely to attend at least one parenting session. It is unknown if fathers themselves were aware that they may need additional help with using effective parenting practices, since observed parenting is often minimally correlated with parents' self-reported parenting (Bögels & Brechman-Toussaint, 2006; Meyer et al., 2015). It may be important to examine predictors of mothers' and fathers' engagement using actor-partner models (Cook & Kenny, 2005), for instance mothers/partners may have played a role in encouraging fathers with less effective parenting practices to participate in ADAPT.

In the second part of the hurdle model, only fathers report of child behavioral problems was a significant predictor of the number of sessions fathers attended. Fathers

may have recognized how relevant the information taught at parenting sessions was to their own child's misbehavior. It is likely that fathers were more motivated to attend a greater number of sessions to learn more strategies to manage their child's behavior.

Predictors of mothers' attendance. Mothers who reported greater mental health symptoms were less likely to attend at least one parenting session. Mothers' mental health symptoms, however, were unrelated to the frequency of parenting sessions attended. Results from the second part of the hurdle model are consistent with research that has found no link between maternal distress and attendance (Baker et al., 2011; Reyno & McGrath, 2006). Only one known study has examined parent mental health in relation to enrollment (participated in at least one session) and contrary to our study, no significant association was found between parent depression and enrollment of parents in a parenting program designed to prevent conduct problems among preschoolers (Baker et al., 2011). This study, however, only included 106 families and did not examine predictors of enrollment for mothers and fathers separately. Although more research is needed, mothers with greater mental health symptoms may need extra encouragement to choose to participate in a parenting program. Because participation in parenting programs have been shown to alleviate parent mental health symptoms (Gewirtz, DeGarmo, Zamir, 2016), program staff may consider discussing the benefits of participating in a parenting program for parenting stress and parental well-being.

Mothers who reported less parental locus of control (i.e., felt less confident in controlling their child's behaviors) had greater odds of attending at least one parenting session, as indicated in the first part of the hurdle model. This result contrasts findings from a study that found parents with lower ratings of parenting efficacy were less likely

to attend a behavioral parent training program (Chacko et al., 2017). The authors recommended several solutions to encourage participation among parents with lower parenting efficacy such as addressing parental concerns regarding the process of the parenting program, clarifying expectations, and explicit discussions about self-perceptions of parenting efficacy prior to enrollment (Chacko et al., 2017). It is possible that conversations with ADAPT's recruitment staff and ADAPT's recruitment materials addressed some of these concerns of mothers in the current study. Perhaps, mothers with lower levels of locus of control felt that their parenting efficacy could be enhanced through participation in the ADAPT program. Alternatively, it may be that mothers with higher parental locus of control find involvement in ADAPT as unnecessary, as they already feel confident in their abilities to control their child's behaviors.

In the second part of the hurdle model, only mothers' satisfaction at the first session attended was associated with the frequency of mothers' attendance. To my knowledge, no other study has examined participant satisfaction as a predictor of parent attendance. Rather, most studies have conceptualized parent satisfaction as a form of program fidelity and/or program engagement (e.g., Berkel et al., 2011; Schoenfelder et al., 2013). The current findings show that mother's first perceptions of the program matter for frequency of involvement. Future research should interview mothers who report lower satisfaction at the first session to determine what aspects of the program they were unsatisfied with and what could be altered to increase their satisfaction. Furthermore, parenting programs may want to assess additional program process variables (e.g., characteristics of facilitators, delivery of content) in relation to participant's engagement (Fox & Gottfredson, 2003). Process variables may be more

amendable than participant characteristics and thus programs may have greater flexibility in altering these variables to encourage greater participation.

Predictors of Home Practice

Many of the same variables that were significant predictors of program attendance were also significant predictors of parents' home practice completion. This is likely due to the high correlation between program attendance and home practice completion (r = .97, $p < .001$). One unique predictor that did emerge was child age. In the first part of the hurdle models, mothers and fathers with an older child had less odds of completing at least one home practice assignment. There is some research that shows parents with older children are less likely to attend parenting programs (Harpaz-Rotem, Leslie, & Rosenheck, 2004; Fleming et al., 2015) but no known studies have examined child age in relation to home practice completion. It is possible that completing home practice was more challenging for parents with older children, as older children may have more obligations (e.g., sports, school) and thus are away from home more often – making it difficult for parents to practice the skills learned in the ADAPT sessions. Alternatively, parents of older children may have found the home practice less relevant to the behavioral problems their children were exhibiting (e.g., substance use).

Predictors of fathers' home practice. Consistent with the hurdle models examining fathers' attendance, fathers with less effective parenting at baseline had greater odds of completing at least one home practice assignment. The number of months fathers were deployed also followed a similar pattern as the aforementioned attendance model. Fathers' longer deployments were marginally associated with greater odds of completing at least one home practice assignment. In the second part of the hurdle model,

fathers who were deployed for a longer duration were less likely to complete home practice assignments. Fathers who have been away from their child longer may find it more difficult to engage in home practice, which requires fathers to interact with their child. Military fathers in qualitative studies have described some of the challenges they experience while trying to resume a parenting role upon reintegration (Walsh et al., 2014; Willerton, Schwarz, Wadsworth, & Oglesby, 2011). For example, one study found that fathers said it took a long time (sometimes up until a year after deployment) before things felt normal again and many fathers felt that during this period, it was important to let the child "warm up" to the parent again (Willerton et al., 2011). No other predictors were significantly associated with fathers' home practice completion.

Predictors of mothers' home practice. Consistent with the models examining mothers' attendance, mothers with higher locus of control and more mental health symptoms were less likely to complete at least one home practice assignment (as indicated in the first part of the hurdle model). However, some unique predictors of mothers' frequency of home practice completion did emerge. Married mothers who were observed at baseline to exhibit more effective parenting practices were more likely to complete a greater number of home practice assignments. This suggests mothers who may be at lower-risk for engaging in coercive parenting skills are more likely to complete a greater number of home practice assignments. Most research shows a dose-response relationship, such that parents who engage more overall are more likely to benefit (Connell, McKillop, & Dishion; 2016; Reid, Webster-Stratton, & Baydar, 2004). Efforts should be made to keep those parents who may be at higher risk (single mothers and mothers with less effective baseline parenting skills) engaged in completing more home

practice assignments over time. This may include testimonials from previous ADAPT participations, continual check-ins with mothers to ensure that they are satisfied with the material taught in each session, and potentially parenting trackers – so that parents may track their own improvements over time.

Predictors of Online Usage

Few variables were associated with mothers' and fathers' online usage. As indicated by the first part of the hurdle model, both single mothers and fathers were more likely to click on ADAPT's online platform a greater number of times than married mothers and fathers. Without a co-parent at home, single parents may be seeking additional support and resources (Keller & McDade, 2000) and thus are more likely to use ADAPT's website

Predictors of fathers' online usage. None of the predictors were significantly associated with the odds of fathers clicking on the ADAPT website at least once. In the second part of the hurdle model, in addition to marital status, only child age was significantly associated with the frequency of fathers' online usage. Fathers with older children were more likely to click on ADAPT's online platform a greater number of times. This finding is somewhat inconsistent with research that shows parents with younger children are more likely to report using online parenting resources (Radey & Randolph, 2009). Unfortunately, little is known about what predicts fathers' online usage, more research is needed in this area.

Predictors of mothers' online usage. In the first part of the hurdle model, only mothers' locus of control was significantly associated with mothers clicking on the ADAPT website at least once. Mothers who reporter lower parental locus of control were

more likely to engage with the online platform at least once. These parents may feel in need of additional help and thus may be more likely to use ADAPT's online resources. Aside from marital status, no other variables were significant predictors of the frequency of mothers' online usage.

Implications and Future Directions

Consistent with previous research (Cowan et al., 2009; Fletcher et al., 2011), fathers in the current study did not engage with the ADAPT program to the same extent as mothers. Recruitment information and material taught at parenting sessions may need to be altered to further encourage father engagement. For example, fathers may perceive their children's problems as less serious than mothers (Connell, Sanders, & Markie-Dads, 1997), and thus may be less motivated to engage in a parenting program. In contrast, some studies report high degrees of concordance between mother and father ratings of child behaviors (Chesmore, He, Zhang, & Gewirtz, 2018; Sanders, Bor, & Morawska, 2007). Rather, it may be that fathers recognize their children's problem behaviors as serious but see the mother as the primary caretaker. Although fathers' participation in parent management programs and child rearing practices has increased, research shows that mothers still spend more time engaged in child-rearing tasks (Pew Research Center, 2015), thus fathers may find the parenting intervention less relevant to them. Parent management training programs may consider several strategies to further encourage father participation including providing greater incentives to families – where both parents attend sessions and sharing the advantages of having both parents participate (e.g., parents may co-parent better together, the child may benefit more; Bagner, 2013; Bagner & Eckberg, 2003).

Regarding predictors of parent engagement, several key takeaways should be emphasized. For fathers, longer deployments were related to fathers' decision to attend parenting sessions, but also with a fewer number of completed home practice assignments. This is a unique and important finding, as the length of time fathers are away from their child(ren) appears to be related to how engaged a father is with a parenting program designed specifically with military fathers in mind. It is encouraging that military fathers were interested and did participate in ADAPT. This is consistent with current research that shows that military fathers often note that involvement with their child following deployment is a major concern for them (Walsh et al., 2014; Willerton et al., 2011). However, fathers also noted that they felt uncomfortable in the family arena, potentially due to their inability to "be there" for significant portions of their child(ren)'s development (Willerton et al., 2011). This may explain why fathers who were deployed longer completed fewer home practice assignments, since these fathers may have been especially nervous/uncomfortable about engaging in the home practice with their child(ren). Parenting programs may consider discussing some of the challenges and hesitations fathers may have with reconnecting and interacting with their child(ren) post-deployment.

For mothers, the key findings show that mothers with greater mental health symptoms are less likely to participate in the ADAPT program and single mothers as well as mothers with less effective parenting practices at baseline were less likely to complete a greater number of home practice assignments. This suggests that mothers who may be at higher risk for engaging in less effective parenting practices (e.g., harsh discipline) may be less likely to participate in ADAPT and/or complete a greater number of home

practice assignments. Perhaps, mothers with less effective parenting practices found the home practice assignments to be challenging and thus became disillusioned with the home practice. It may be helpful to interview these mothers to see what if any barriers prevented their involvement in the program. Mother's satisfaction with the group sessions and home practice assignments, may be a particularly salient factor to consider, as this variable was found to be significantly associated with mothers' increasing involvement in ADAPT.

Study limitations

Several limitations should be noted. Home practice was self-reported by parents at program sessions. It is possible that many parents over-reported the number of home practice assignments completed. Additionally, we have no way of knowing whether parents who did not return to following sessions completed their home practice assignments. Future studies should consider more objective measures of program engagement. For example, a worksheet could be completed to accompany any home practice assignments and/or home practice could be tracked automatically by requiring parents to complete assignments online. Another limitation is the lack of facilitator-rated parent engagement, which would provide a clearer picture of how much parents actively participated (e.g., practiced the skills being taught) during sessions. Finally, mothers and fathers were examined separately in the current study, which may have limited the power to detect some differences.

Conclusion

This study is one of the first to examine predictors of program engagement in a parenting program for mothers and fathers separately. Given the low attendance rates

among fathers (Scourfield et al., 2014), it is important to identify factors that may be associated with father engagement. Often mothers and fathers are lumped together, which may miss important distinctions between what predicts mother program engagement versus father program engagement. Indeed, the current study provides evidence to suggest that there are important differences between what predicts mothers' and father's engagement in a parenting program. Furthermore, findings suggest that there may be distinctions in what predicts different forms of participant engagement. It will be important for future studies to continue to identify what forms of engagement (e.g., attendance, home practice) are most predictive of improvements in targeted outcomes. For example, recent studies show that parents' engagement in home practice may be more predictive of intervention outcomes than program attendance (Berkel et al., 2016). Most studies focus exclusively on attendance, which may not help identify how to fully engage parents in other forms of engagement.

Study 2: A Complier Average Causal Effects (CACE) Approach: Is Mother and Father Engagement Related to Improvements in Parenting among Military Families?

With the recent and long-lasting conflicts in Iraq and Afghanistan, there was been increasing concern about the detrimental effects of wartime deployment on American service members and their families. Because over two million children in the United States have been affected by a parent's deployment (Chartrand, Frank, White, & Shope, 2008), there is growing alarm about how parent deployment may affect the developmental outcomes of children in military families. Multiple studies have found increased rates of psychosocial difficulties such as emotional difficulties and behavioral problems among military children and adolescents (Acion et al., 2013; Gilreath et al., 2013; Reed, Bell, & Edwards, 2011). Because child maladjustment is associated with a host of problems across the lifespan (Hale & Viner, 2012), preventive interventions for military families are sorely needed.

While most military families are resilient, the distress following repeated cycles of separation and combat-related trauma may impair and/or disrupt parental functioning and effective parenting practices (Gewirtz & Davis, 2014). A recent systematic review of research on military families found that parental distress, including depression and PTSD symptoms, was related to increased parenting stress and poor parent-child relationships during the reintegration process (Creech, Hadley, & Borsari, 2014). Family stress models show how a family stressor (e.g., wartime deployment) may indirectly affect child adjustment through impaired parenting (Conger et al., 2002). Similarly, the social interaction learning model shows how the frequency of coercive parenting practices (e.g.,

harsh discipline) increases during parent-child interaction within a stressful family context (Patterson, 2005). Because effective parenting may buffer the negative impact of a stressful family context (i.e., wartime deployment) on child adjustment (Gewirtz, Forgatch, & Wieling, 2008), preventive interventions such as parent management training programs focus on improving parenting to prevent poor child outcomes. Indeed, parent management training programs have been effective in improving parenting outcomes among both clinical and prevention populations (Michelson et al., 2013).

Until recently, no parent management training program has been developed and evaluated in a randomized controlled trial for military families following wartime deployment. The After Deployment, Adaptive Parenting Tools (ADAPT) intervention was created and evaluated in a randomized, longitudinal prevention trial in response to this need. ADAPT is a modification of a family of interventions known as Parent Management Training-Oregon Model (PMTO; Forgatch & Patterson, 2010). Based on the social interaction learning model (Patterson, 2005), PMTO aims to reduce coercive parent-child interactions by improving positive parenting practices. To date, using an intent-to-treat approach, ADAPT's effectiveness indicates that families who participated in prevention programing show improvements in targeted parenting practices and decreases in children's adjustment problems, whereas families in the control condition (who did not participate) did not evidence these changes (Gewirtz et al., 2017).

Evaluating the impact of a preventive intervention is not without challenges. For example, there is wide variation in which families assigned to attend the program actively participate. Some families will receive no to minimal exposure to the program, even though they were assigned to the intervention condition. Intention-to-treat (ITT) analyses,

often considered the gold standard for examining intervention effects, may underestimate the effects of the intervention on parenting outcomes. To better understand intervention effects, some programs examine parents' engagement (i.e., attendance) in relation to outcomes. Of the studies that have examined program engagement in relation to parenting intervention outcomes, most have found that parents' engagement is positively associated with targeted parenting behaviors. Parenting programs such as Family Check-Up (FCU) and the Incredible Years have found that parents who are active engagers tend to have better outcomes than parents who are considered non-engagers (Connell et al., 2016; Reid et al., 2004; Veronneau, Dishion, Connell, & Kavanagh, 2016).

One of the challenges of examining participant engagement, however, is that there is no adequate control group because participants are not randomly assigned to different levels of engagement. Rather, it is likely that specific characteristics of participants (e.g., baseline parenting, family income, parental mental health) determine to what degree participants engage with the program. For this reason, the complier average causal effect (CACE) model was developed as a statistical method to enable researchers to account for varying levels of engagement and non-randomization (Jo, 2002). This method allows for the comparison between the participants in the program (i.e., intervention) with a similar subgroup of participants from the control group.

Little is known about differential engagement effects on mothers' and fathers' parenting. Most evaluations of parent management training programs define engagement as the presence of at least one parent and thus do not distinguish intervention effects among mothers and fathers. Yet, recent research suggests that intervention effects may be more pronounced when both parents participate (Bagner, 2013). Preliminary analyses

from ADAPT, using an intent-to-treat approach, found that mothers significantly benefited in terms of effective parenting practice at 12-month follow-up, but fathers did so only marginally (Gewirtz & DeGarmo, 2014). Examining engagement effects on parenting outcomes, using a CACE modeling approach, separately for mothers and fathers may uncover why differential intent-to-treat effects in the ADAPT study exist. Perhaps, fathers need to attend more face-to-face parenting sessions than mothers to benefit.

The Current Study

The current study examined whether mothers' and fathers' engagement in ADAPT is associated with changes in parental locus of control and effective parenting at 12-month follow-up. Parental locus of control, parents' beliefs of their own control over their child's behavior, was included as an outcome because it is believed to be a proximal variable. Parental locus of control has been associated with improved parenting practices (Gewirtz, DeGarmo, Lee, Morrell, & August, 2015) and has also been linked to improvements in parent and child outcomes among the current sample (Piehler, Ausherbauer, Gewirtz, & Gliske, 2016). It is hypothesized that mothers and fathers who adequately engage in the ADAPT program (i.e., attend four or more sessions) will improve in both their parental locus of control and effective parenting practices at 12-month follow-up, while accounting for baseline levels of parental locus of control and effective parenting practices as well as covariates that may be predictive of engagement status (i.e., child age, child gender, child behavioral symptoms, marital status, household income, number months parent deployed, time since deployment, and mental health symptoms).

Methods

Participants

The sample included 336 (i.e., 314 mothers, 294 fathers, 336 children) National Guard and Reserve families. Families were eligible for participation in the study if they had at least one child living with them (4-12 years-old), were willing to participate in a parenting program if selected, and at least one parent was previously deployed overseas in service of Operation Iraqi Freedom (OIF; Iraq), Operation Enduring Freedom (OEF; Afghanistan), or Operation New Dawn (OND; Iraq). Of the 336 families, 272 families had two parents participating in the study and 64 families had one parent participating in the study (41 mothers, 23 fathers). Most parents were married (89.3% of fathers and 88.5% of mothers) and were married on average for 9.4 – 9.8 years (mothers and fathers, respectively). Parents identified as predominantly European American/White (88.4% of fathers and 92.7% of mothers). Many families were considered middle-class, as most families reported a household income between US $40,000 – $79,999 (43.5%) and US $80,000 – $119,999 (28.2%). On average, parents reported having 2.32 – 2.37 children (mothers and fathers, respectively). If families had multiple children, one child was selected that met eligibility (4-12 years-old) to serve as the target child. Children (N = 336) in the study were 53.3% girls, and had a mean age of 8.3 (SD = 2.5).

Fathers were deployed in 95% of families and mothers were deployed in 18.2% of families. Of the parents that were deployed, fathers were deployed for an average of 1.96 deployments (SD = 1.14) and mothers were deployed for an average of 1.37 deployments (SD = 0.75). Parents were deployed for 6 months or less (6% fathers, 17.9% mothers), 7 to 12 months (28.1% fathers, 35.7% mothers), 13 to 18 months (12.5% fathers, 19.6%

mothers) 19 to 24 months (19.6% fathers, 17.9% mothers), 25 to 30 months (9.6% fathers, 1.8% mothers), 31 to 36 months (13.9% fathers, 5.4% mothers), or 37 months or more (10.3% fathers, 1.8% mothers). Parent military branches included Army National Guard (59%), Army Reserves (12.9%), Air National Guard (10.7%), Navy Reserves (6.6%), Air Force Reserves (2.8%), and Marine Reserves (0.3%).

Procedure

Participants were recruited through multiple methods, including presentations at pre-deployment and reintegration events for NG/R families, referral from military personnel, media outlets such as radio advertisements and online social media, mailings from the local Veteran's Administration Medical Center to OIF/OEF/OND veterans, and word-of-mouth from fellow military families and service members. Interested families could log-on to the ADAPT website to complete informed consent and a screener. Eligible parents were then invited to participate in the online and in-home baseline assessments. After the completion of the baseline assessment, families were randomized to either the ADAPT parenting program (60% of families) or to services-as-usual (40% of families; web and print resources). ADAPT staff informed parents of the result of the randomization process and discussed arrangements for those who were randomized to participate in the ADAPT parenting program. In two parent families, both parents were encouraged to attend the ADAPT sessions. Staff, however, explained to such families that attendance by both parents was not mandatory. Parenting sessions occurred in several locations (e.g., school, community centers) and were designed to be conveniently located in parents' geographic area. If no parenting sessions were currently being delivered in the parent's geographic area, parents had the option to wait until the next

available group. Families received up to $100 for their completion of online assessments (each parent paid $25) and in-home assessments (each family received $50). Children also received a small gift (e.g., toy) for their participation. The current study uses data collected at baseline and at 12-month follow-up. The investigators' university institutional review board approved all the described procedures.

Of the 314 mothers and 294 fathers who completed the baseline assessment, 85% of families were retained (81% of mothers and 76.8% of fathers) at the 12-month follow-up assessment (see Figure 2.1, CONSORT chart). There were no differences in rates of retention between families randomized to the intervention (80%) and families randomized to the control condition (88%; χ^2 (1) = 2.33, $p > .05$).

ADAPT Intervention

ADAPT is a modification of the Parent Management Training: Oregon Model (PMTO). Aligned with the original PMTO program, ADAPT aims to improve five parenting practices: positive involvement, skill encouragement, problem-solving, monitoring, and effective discipline (Forgatch & Patterson, 2010). In addition, however, ADAPT aims to improve a 6th key parenting practice: emotion socialization. This key skill was introduced to address deployment and combat stressors – and the concomitant worry and anxiety of non-deployed family members. Thus, mindfulness exercises, and emotion coaching skills were taught in group, and special attention was paid to military culture and values. Parenting skills were taught weekly in 2-hour group sessions over the course of 14 weeks. Parents participated in the program with six to 10 other families and practiced the parenting skills through active learning methods such as role-play, observation, and discussion. Parents had the opportunity to engage with an interactive

website that included additional parenting resources and supplemented material taught in the face-to-face parenting sessions. Parents also received home practice assignments at each session to practice with their children prior to the next face-to-face session. All sessions were delivered by trained facilitators, who received ongoing coaching throughout the program (For further description of the intervention, please see Gewirtz et al., 2014).

Measures

Effective parenting. Mothers' and fathers' effective parenting was observed at baseline and 12-month follow-up. Parents were videotaped during structured family interaction tasks (FITs). The FITs included 40-60 minutes of parent-child interactions. During the FITs parents and children engaged in several activities focused on problem solving, discussion of conflicts, monitoring, and teaching. The videotapes were then coded by trained coders, who were blind to the intervention condition. Using the Coder Impressions System (Forgatch, et al., 1992), coders provided global ratings corresponding to key parenting domains: problem solving, encouragement, monitoring, effective discipline, and positive involvement.

Problem solving was scored using nine-items, which assessed the quality of the parent-child solution, likelihood of the family putting the solution to use, and extent of resolution (α = .87 -.89; ICC = .88 - .94). Skill encouragement was scored using eight-items, which assessed parents' ability to promote children's skill development through encouragement and scaffolding strategies (α = .83; ICC = .72 - .76). Monitoring was scored with four-items, which assessed parents' supervision and knowledge about the child's activities (α = .71; ICC = .64 - .74). Items were rated on a 5-point Likert scale

ranging from 1 (*untrue*) to 5 (*very true*). Harsh discipline was scored with eight-items, which assessed parent's use of overly strict, coercive, authoritarian, and/or erratic parenting (α = .75; ICC = .58 -.78). Positive involvement was measured with 10-items, which evaluated parents' level of warmth, affection, and empathy towards the child (α = .75; ICC = .76 - .84). Items for positive involvement and harsh discipline were rated on a 6-point Likert scale ranging from 1 (*never*) to 6 (*always*). Items for each scale were then averaged together separately for mothers and fathers. All five scales were used to create a latent construct of effective parenting separately for mothers and fathers.

Parent locus of control. Mother and father locus of control was assessed at baseline with the 24-item Parental Locus of Control Scale (PLOC; Campis, et al., 1986). The PLOC is composed of four parenting control orientations: parental efficacy (e.g., "My child usually ends up getting his way or her way, so why try"), parental responsibility (e.g., "My child's behavior problems are no one's fault but my own"), children's control of parents' life (e.g., "My child influences the number of friends I have"), and parental control of children's behavior (e.g., "My child's behavior is sometimes more than I can handle"). The 24-item PLOC was developed from a 47-item scale, but was shortened to 24 items by selecting items from each subscale that had the highest factor loadings in the original study (Hassall et al., 2005). Items were rated on a 5-point Likert scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). Items were reverse coded such that higher scores indicated higher locus of parental control. Total mean scores was obtained for mothers and fathers (mothers: α = .75 and fathers: α = .73).

Intervention status. Intervention status was used to index whether parents were randomly assigned to the control or intervention condition. Random assignment was coded as 0 (*control*) and 1 (*intervention*).

Program engagement. Families were classified as engaged, if parents attended at least four of the intended sessions. This number was chosen because the distribution of attendance was bimodal (consistent with what has been found in past trials of PMTO), such that those families who participated in at least four sessions were more likely to complete the program (Doty, Rudi, Pinna, Hanson, & Gewirtz, 2016). Using this definition, 59.4% of fathers and 63.7% of mother in the intervention were classified as engaged. In the control condition, engagement was coded as missing data (as per CACE analyses approach).

Cohort. All families were assigned to a cohort based on timing of recruitment and geographic location. There was a total of seven cohorts. Some cohorts (cohorts 3 – 7), were offered additional incentives to engage in the online ADAPT supplemental resources. To account for any potential differences between cohorts, cohort was used as a clustering variable in analyses.

Demographics. Although families may have had multiple children, a target child was chosen to assess intervention effects on child outcomes. Parents reported the child's gender and birthdate. Child gender was coded as 1 (*male*) and 2 (*female*). Child age at baseline was calculated by subtracting the date of birth from the date of the in-home assessment. Parents reported household income in $10,000 increments. Response options ranged from 1 (*less than $10,000 per year*) to 17 (*$150,000 or more per year*). Marital status was coded 1 (*not married*) and 2 (*married*).

Child behavioral problems. Baseline child problem behaviors were assessed using the Behavioral Assessment Scale for Children (2nd ed.) – Parent Rating Scale (BASC-2-PRS; Reynolds & Kamphaus, 2004). The BASC-2-PRS is a widely-used assessment with good internal consistency and test-retest reliability, which measures the broad domains of externalizing problems, internalizing problems, and adaptive skills (Reynolds & Kamphaus, 2004). Two versions of the BASC-2-PRS were used: the child form (134 items; normed for ages 6-11) and the adolescent form (150 items; normed ages 12-21). Items were rated on a 4-point scale ranging from 0 (*never*) to 3 (*almost always*). The current study utilized mother and father ratings on the Behavioral Severity Index (BSI) composite, which is comprised of four subscales: aggression, attention problems, depression, and, hyperactivity. Individual raw scores from both mothers and fathers were then compared to normative data for children of the same age, which resulted in standardized *T* scores ($M = 50$; $SD = 10$). *T* scores were used in all analyses.

Parent deployment. The number of months mothers and fathers were deployed for was assessed by asking parents the following question: "For the number of deployments that you indicated, what is the total number of months that you were deployed since 2011?" Parents responses were scored on a scale ranging from 0 (*never deployed*) to 7 (*37 months or more*); higher scores indicated greater number of months parent was deployed. Mothers and fathers self-reported their return date from their most recent deployment. Time (in months) since last deployment was assessed by subtracting participant's return date from the date of the in-home assessment.

Parent mental health symptoms. Mothers and fathers self-reported mental health symptoms at baseline using the 25-item version of the Hopkins Symptom

Checklist (HSCL-25; Derogatis et al., 1974). The HSCL-25 assesses both anxiety symptoms (10 items) and depression symptoms (15 items). Example items include "feeling low in energy or slowed down" and "suddenly scared for no reason." Items are rated on a 4-point scale ranging from 1 (*not at all*) to 4 (*extremely*). All 25 items were averaged to produce a total symptom score, with higher scores indicating greater mental health symptoms. Reliability was good for both mothers and fathers (α = .93 and .95, respectively).

Analytical Plan

Distributions and bivariate correlations of study variables were examined for mothers and fathers separately. Following descriptive statistics, attrition for mothers and fathers was examined to determine whether there were any significant differences between parents who completed the follow-up assessment and parents who dropped out at 12-month follow-up. Additionally, mothers and fathers in the control and intervention conditions were compared on all study variables assessed at baseline to ensure there were not significant differences between parents assigned to the control condition versus the intervention condition.

Two parenting outcomes were examined: parental locus of control and effective parenting practices. Parental locus of control was assessed using an observed variable and effective parenting practices were assessed using a latent construct of all five parenting practices (i.e., positive involvement, discipline, encouragement, problem-solving, monitoring). Two initial confirmatory factor analysis (CFA) measurement models (one for mothers and one for fathers) were created with two latent constructs – baseline and 12-month follow-up effective parenting. CFA models were assessed using the following

fit indices: (1) comparative fit index (CFI) greater than .95; (2) root mean square error of approximation (RMSEA) below .06, and (3) standardized root mean square residual (SRMR), below .08 (Hu & Bentler, 1999).

Following theses measurement models, CACE models were then estimated. CACE models using a mixture modeling framework were employed to examine mother and father program engagement separately. Engagement status was included as a training variable for estimating class membership (known in the intervention group but missing in the control group). Mixture modeling is used because it enables the examination of an unobserved subpopulation (i.e., a comparison group from the control group that matches the observed compliers from the treatment condition). To use CACE analysis and provide an unbiased estimate of intervention effects for engagers, it is important that several assumptions are met. These assumptions include: (a) assignment to treatment is random; (b) outcomes for participants are independent of the outcomes for other participants; (c) there are no "defiers," or individuals who do the opposite of instructions (i.e., participation in the intervention when told to be in the control); (d) intervention assignment is independent and/or does not predict outcomes for non-engagers, and (e) the intervention condition includes some participants who engage. While ADAPT meets most of these assumptions, it is difficult to evaluate whether assumption d, known as the "exclusion restriction" assumption is met. If not met, CACE estimates of intervention effects may be biased (Jo, 2002). However, violations of this assumption can be ameliorated by including covariates that may predict engagement.

In all models, treatment assignment predicted parental locus of control and effective parenting at 12-month follow-up for the engager class only (consistent with the

exclusion restriction assumption). All models included the following covariates as both predictors of class membership and parent outcome variables at 12-month follow-up: child age, child gender, child behavioral problems, parent marital status, household income, number of months parent was deployed, number of months since deployment, and parental mental health symptoms. Number of months since last deployment was included in fathers' models only, as too few mothers had experienced deployment. Models also controlled for baseline levels of outcome variables (i.e., parental locus of control, effective parenting practices). Because parents participated in the ADAPT study in cohorts, the potential effect of clustering was accounted for by using the TYPE = COMPLEX with CLUSTER = Cohort function in Mplus. All analyses were conducted in Mplus version 8 (Muthén & Muthén, 1998-2017).

Typical estimates of model fit (i.e., chi-square test, CFI) are not available for mixture models in Mplus. Rather, entropy, a summary statistic of the probability of membership in the most-likely class for each individual (i.e., engagement vs. non-engagement class) was used. Values may range from 0 to 1.0, with values closer to 1.0 representing better classification. Values of .80 or higher will indicate excellent fit.

Missing data. A missing-value analysis was conducted using SPSS version 22. The Little's MCAR test was conducted on all measures and showed that the pattern of missing values was not completely random among father study variables, χ^2 (346) = 417.2, $p < .01$, and mother study variables, χ^2 (332) = 397.1, $p < .01$. The percentage of missingness on fathers' study variables ranged from 0% to 29.9%. The percentage of missingness on mothers' study variables ranged from 0% to 27.1%. A sum of missing values for each participant was created. It was found that missingness was correlated with

fathers' mental health symptoms and mothers' household income and cohort. Therefore, it can be assumed the data are missing at random (MAR) and models can be estimated using full information maximum likelihood (FIML). FIML uses all available information from the observed data to produce estimates. Compared with other missing data strategies such as mean imputation and listwise deletion, FIML is the preferred approach to handling missing data (Schafer & Graham, 2002).

Results

Means, standard deviations, and bivariate correlations are reported in Table 2.2 and Table 2.3. Attrition analysis using a series of t-tests indicated that there were no significant differences between mothers and fathers who remained in the study and those who dropped out at 12-month follow-up (but participated in the baseline assessment) on most study variables. However, mothers who remained in the study at 12-months had younger children on average (M = 8.13, SD = 2.39) than mothers who dropped out (M = 9.01, SD = 2.61), $t(312) = -2.78$, $p = .006$. T-tests also revealed no significant differences on the baseline levels of the FITs, apart from mothers' skill encouragement, mothers' positive involvement, and mothers' monitoring. Mothers who remained in the study at 12-months had greater skill encouragement, $t(292) = 2.82$, $p = .005$, greater positive involvement skills, $t(292) = 3.32$, $p = .001$, and greater monitoring skills, $t(280) = 2.12$, $p = .037$, than mothers who dropped out. There were no significant differences on any of the study variables between fathers who remained in the study at 12-months and fathers who dropped out. T-tests were also used to examine whether there were significant group differences between mothers and fathers assigned to the ADAPT intervention and those

assigned to the control condition. No significant differences on any of the study variables were found between conditions.

Two CFAs were estimated: one for mothers and one for fathers. The baseline and 12-month follow-up effective parenting latent constructs each included five indicators: problem solving, skill encouragement, monitoring, positive involvement, and discipline. For fathers, all factor indicators were significantly related to the latent construct to which they were assigned. Ranges of r's for father's observed parenting indicators were as follows: problem solving (.50 to .57, $p < .001$), positive involvement (.93 to .94, $p < .001$), encouragement (.54 to .65, $p < .001$), harsh discipline (-.31 to -.55, $p < .001$), and monitoring (.34 to .43, $p < .01$). The father's CFA met several of our fit indices including RMSEA = 0.04, and SRMR = 0.05, and the CFI = 0.94. For mothers, all factor indicators were significantly related to the latent construct to which they were assigned. Ranges of r's for mother's observed parenting indicators were as follows: problem solving (.54 to .58, $p < .001$), positive involvement (.95 to .98, $p < .001$), encouragement (.49 to .50, $p < .001$), harsh discipline (-.32 to -.45, $p < .001$), and monitoring (.21 to .25, $p < .01$). The mothers' CFA met several of our fit indices including RMSEA = 0.07, and SRMR = 0.06. The CFI indicated a marginal fitting model for mothers (0.84).

Fathers' Parenting Outcomes

Results from fathers' CACE models are presented in Table 2.3. Using attendance at four sessions or more, in the model predicting fathers' parental locus of control, the engagement rate for fathers was 62.6%. The intervention assignment was significantly associated with improvements in parental locus of control at 12-month follow-up among the engagement class ($\beta = .10$, $p < .05$). None of the covariates were significant

predictors of class membership in the parental locus of control model. The engagement rate for fathers was 62.9% for the model predicting fathers' effective parenting practices. Using the four sessions or more engagement definition, the intervention assignment was not significantly associated with improvements in fathers' effective parenting practices at 12-month follow-up among the engagement class ($\beta = .22$, $p < .10$).

Mother Parenting Outcomes

Results from mothers' CACE models are presented in Table 2.4. Using attendance at four sessions or more, in the model predicting mothers' parental locus of control, the engagement rate for mothers was 68.2%. Among the engagement class, the intervention assignment was significantly associated with improvements in mothers' parental locus of control at 12-month follow-up ($\beta = .14$, $p < .01$). Mothers report of child behavioral problems at baseline was a significant predictor of class membership, such that mothers who reported greater child behavioral problems at baseline had greater odds of belonging to the engagement class ($OR = 1.05$, $p < .01$). The engagement rate for mothers was 69.4% for the model predicting mothers' effective parenting practices. Using the four sessions or more engagement definition, the intervention assignment was also significantly associated with improvements in mothers' effective parenting practices at 12-month follow-up among the engagement class ($\beta = .25$, $p < .10$). Again, mothers who reported greater child behavioral problems at baseline had greater odds of belonging to the engagement class ($OR = 1.07$, $p < .001$).

Post-hoc analyses. Because only a marginal significant CACE effect was found for fathers, it was hypothesized that fathers may need to attend more sessions to benefit from the ADAPT program. Thus, subsequent analyses were conducted to determine the

number of sessions needed for fathers to make significant improvements in effective parenting practices at 12-month follow-up. Fathers did not significantly improve in observed parenting practices until 11 sessions or more was used to define engagement status (β= .45, p = .022). Using this definition, 19.7% (n = 58) of fathers were in the engagement class (entropy = .75). The length of father deployment and fathers' baseline effective parenting practices were significant predictors of engagement class. Fathers who were deployed for a longer duration had less odds of belonging to the engagement class (OR = 84, p = .000) and fathers who were observed to exhibit more effective parenting practices at baseline had lower odds of belonging to the engagement class (OR = .37, p = .003).

Discussion

Previous studies of ADAPT have found significant improvements in couple parenting at 12-month follow-up (Gewirtz et al., 2017). This study extends these analyses to look at the effects of the ADAPT program for mothers and fathers separately and to study the effect of program engagement on improvements in parental locus of control and effective parenting at 12-month follow-up. Results revealed that both mothers and fathers who belonged to the engager class (defined as attending four or more sessions) improved in parental locus of control and that mothers, but not fathers, significantly improved in parenting practices at 12-month follow-up.

Findings showed that parents who participated in at least four parenting group sessions experienced increases in their beliefs that their parenting behaviors have a significant impact on their child's behavior (Freed & Tompson, 2011). This finding is consistent with intent-to-treat analyses that found significant improvements in mothers'

and fathers' parental locus of control at 6-month follow-up (Piehler et al., 2016). These results are encouraging as parental locus of control is thought to be a key proximal outcome of ADAPT and parent management training programs more broadly (Mah & Johnston, 2008; Sawrikar & Dadds, 2018). In a previous study using the same sample, improvements in parental locus of control among both mothers and fathers was associated with subsequent reductions in parents' PTSD, depression symptoms, and suicidal ideation (Gewirtz et al., 2016). Similarly, another study found that parental locus of control was associated with improvements in observed parenting two-years post-baseline in a family-based program for formerly homeless mothers (Gewirtz et al., 2015).

In terms of parenting practices, only mothers who belonged to the engager class significantly improved in parenting practices at 12-month follow-up. Although following a similar trend, a significant treatment effect was not found among fathers who belonged to the engager class (using 4 sessions or more to define engagement). This may be concerning, as research suggests that fathers' parenting has a distinctive and meaningful effect on children's development (Lamb & Lewis, 2013). Fathers' positive parenting has been associated with lower levels of child behavioral and emotional problems (Amato & Rivera, 1999; Sarkadi, Kristiansson, Oberklaid, & Bremberg, 2008) and fathers' disengagement, coercive parenting, and greater use of corporal and verbal punishment has been associated with increased behavioral problems (Burbach, Fox, & Nicholson, 2004; DeGarmo & Forgatch, 2012; Ramchandani et al., 2013). In fact, some studies suggest that fathers may contribute to children's behavioral development, over and above the effect of mothers (Ramchandani, Stein, Evans, & O'Connor, 2005). Additionally, fathers' participation in parenting programs has been associated with longer-lasting

behavior change among children and more effective co-parenting (Bagner & Eyberg, 2003; Schoppe-Sullivan et al., 2009).

Because few parenting interventions disaggregate findings by parent gender (Panter-Brick et al., 2014), it is difficult to known whether our finding is consistent with past research. However, a recent meta-analysis of 28 randomized controlled trials of the Triple P-Positive parenting program provides some support, as the study found that Triple P had a significantly greater effect on mothers' improved parenting practices relative to fathers (Fletcher et al., 2011). Yet, previous evaluations of PMTO have shown improvements in fathers' parenting practices (DeGarmo & Forgatch, 2007). Rather, it may be that although many fathers made improvements in their parenting skills, some fathers in the current sample had more challenges engaging with the material taught in ADAPT, especially relative to mothers. Because most fathers were deployed (95%) – many of whom spent long periods away from their children and were exposed to combat-related stressors, fathers may have had a more difficult time actively participating during sessions and/or practicing skills taught in the program at home. For example, child misbehavior could act as a trigger for a father who meets clinical criteria for PTSD. There is some corroboration for this, as fathers in the current sample who met clinical criteria for PTSD were less likely to benefit from the ADAPT intervention relative to fathers who did not meet clinical criteria for PTSD (Chesmore, Piehler, & Gewirtz, 2017).

It may also be that these fathers simply require a higher dosage for significant treatment effects to be realized. Post-hoc analyses revealed that fathers in the engager class (who attended at least 11 parenting sessions) did improve in their parenting practices at 12-month follow-up. Because mothers often serve as the primary caregivers

(Kotila, Schoppe-Sullivan, & Kamp Dush, 2013), fathers may require more practice with the parenting skills taught in the ADAPT program before they evince significant improvements in their parenting abilities. In-depth interviews with fathers in parent-management training programs may also be helpful for understanding what motivates fathers to not only attend parenting sessions, but also to practice the skills taught at home with their children.

Several limitations of the present study should be considered. First, there were some differences between mothers who dropped out of the study at 12-month follow-up and mothers who were retained. Although FIML was used to account for missing data, this analytic approach assumes data are missing at random. Yet, the differences in attrition analyses suggest that data may not be missing at random, which may bias findings. Second, entropy was low (.65 - .75), potentially indicating poor class discrimination. However, a review of model fit indices for mixture models found that entropy is often inaccurate for small samples and for unbalanced mixture proportions (Henson, Reise, & Kim, 2007). Furthermore, other studies using CACE models have noted similar entropy sizes (c.f. Dishion et al., 2014; Schultz, Evans, Langberg, & Schoemann, 2017). Our results should also be replicated with other samples, as fathers in the current sample were from military families, many of whom were recently deployed in Iraq and Afghanistan. Thus, findings may not be generalizable to other parents participating in parent management training programs. Finally, engagement was defined using the number of sessions mothers and fathers attended, but alternative ways to define engagement could be used. For example, future studies may consider using home practice

completion or facilitator ratings of active participation during face-to-face sessions as ways to define participant engagement.

Conclusion

This study is important because there are few randomized controlled trials of parenting programs that have examined the impact of intervention effects for mothers and fathers separately. We provide preliminary support for the effectiveness of a parent management training program in improving parents' parenting practices and parental locus of control at 12-month follow-up. Our study found that among fathers who attended four or more parenting sessions, fathers did not make significant improvements in terms of parenting practices. However, post-hoc analyses revealed that fathers who attended 11 or more sessions did significantly improve in terms of effective parenting practices. Fathers may require a higher dosage and/or programming may need to be adapted to ensure fathers are actively engaged and that significant improvements are attained at smaller dosage levels.

General Conclusion

Together Study 1 and Study 2 contribute to research examining the effectiveness of preventive interventions targeting improvements in parenting. As hypothesized, the results of Study 1 show that fathers in the ADAPT study engaged in the parenting program to a lesser extent than mothers. Study 1 also shows that there is variation in what predicts fathers versus mothers' engagement in a parenting intervention as well as variation in what predicts different forms of program engagement (i.e., attendance, home practice, online usage).

Study 2 shows that although both mothers and fathers who engage in the ADAPT program make improvements in parental locus of control at 12-month follow-up. Although both mothers and fathers appear to improve in terms of parenting practice at 12-month follow-up, only mothers made significant improvements. This is an important finding, as few evaluations of parent management programs examine intervention effects separately for mothers and fathers and these findings suggest that fathers may require additional support to ensure that fathers are also making significant improvements in terms of parenting practices. However, post-hoc analyses revealed that fathers that attended 11 or more parenting sessions did significantly improve in their parenting practices. This suggests that fathers in the current sample may need to attend more sessions than mothers, as it is possible that fathers require more practice to make significant improvements in their parenting practices.

Understanding the engagement of both fathers and mothers in parent management training programs is critical to healthy developmental outcomes among children. The research is clear that both parents may contribute to their child's success. Although

findings from the current studies should be replicated, findings from both studies suggest that more efforts need to be taken to encourage father participation in parenting programs. A recent review offers some helpful tips such as ensuring that both mothers and fathers are informed individually and reminded about the importance of program participation, ensuring that both parents are contacted individually following nonattendance, and that both parents are encouraged to complete home practice (Panter-Brick et al., 2014). As researchers continue to learn more about who participates and benefits from parenting management training programs, the effectiveness of parenting programs, such as ADAPT can continue to be enhanced for all parents.

Table 1.1

*Inter-correlations between **Fathers'** Study 1 Independent Variables*

Study variables	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Attendance	5.80	5.0													
2. Home practice	4.67	4.4	.95***												
3. Online usage	17.00	23.6	.35***	.41***											
4. Child gender	1.54	0.5	-.11	-.11	-.11										
5. Child age	8.38	2.6	-.14†	-.14†	.02	-.04									
6. Child behavioral problems	50.31	9.8	.17*	.15†	-.04	-.17*	-.03								
7. Marital status	1.87	0.3	.01	.02	-.08	.10	-.10	-.12							
8. Household income	8.63	3.7	-.04	-.04	-.02	-.06	.15*	-.12	.21**						
9. Months deployed	3.79	1.9	.09	.04	.01	-.02	-.03	-.02	-.03	-.11					
10. Months since deployment	34.62	30.9	-.07	-.08	.04	-.003	-.10	-.08	-.15†	.11	-.27***				
11. Mental health symptoms	1.50	0.5	-.05	-.05	-.03	.13†	.06	.19*	-.05	-.12	-.04	.17*			
12. Parent locus of control	3.64	0.4	.-.05	-.06	.05	-.01	.09	-.41***	.01	.10	.12	-.16*	-.33***		
13. Effective parenting	2.29	0.5	-.19*	-.18*	.05	-.01	-.13	-.13	-.09	.23**	-.07	.03	-.08	.12	
14. Satisfaction at the first session	3.34	0.5	.02	.04	.03	-.12	-.13	-.11	-.07	-.13	.03	-.01	.19*	-.02	-.09

Note. Child gender was coded 1 (*male*) and 2 (*female*) and marital status was coded 1 (*single*) and 2 (*married*). † p<.10, * p<.05, ** p<.01, ***p<.001

Table 1.2

*Inter-correlations between **Mothers**' Study 1 Independent Variables*

Study variables	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. Attendance	6.62	5.07												
2. Home practice	5.51	4.54	.96***											
3. Online usage	22.71	23.9	.41***	.43***										
4. Child gender	1.54	0.50	-.05	-.06	-.03									
5. Child age	8.17	2.47	-.18*	-.18*	.08	-.02								
6. Child behavioral problems	49.30	9.75	.14†	.11	.05	-.13†	.01							
7. Marital status	22.7	23.9	.03	.02	.03	.10	.06	-.11						
8. Household income	8.55	3.85	.05	.03	.08	-.04	.18*	-.14†	.17*					
9. Months deployed	0.45	1.10	-.02	-.04	-.05	-.02	-.04	.12	-.31***	-.04				
10. Mental health symptoms	1.51	0.42	.001	-.02	.01	-.003	-.13†	.35***	-.22**	-.21**	.27***			
11. Parental locus of control	3.61	0.42	-.16*	.15†	-.13†	.19*	-.15†	-.43***	.19*	.16*	-.14†	-.23**		
12. Effective parenting	2.40	0.41	-.01	-.002	-.01	.03	-.06	-.06	.14†	.22**	-.07	-.05	.10	
13. Satisfaction at first session	3.52	0.52	.24**	.23*	.06	-.05	-.09	-.06	-.11	-.03	-.04	.05	.19*	.01

Note. Child gender was coded 1 (*male*) and 2 (*female*) and marital status was coded 1 (*single*) and 2 (*married*). † p<.10, * p<.05, ** p<.01, ***p<.001

Table 1.3

Model Fit Indices

Model	Log-likelihood	AIC	ABIC	Dispersion parameter (k)
Father attendance				
Poisson	-3889.6	7957.3	7959.6	
Negative binomial	-3779.9	7739.9	7742.2	
ZIP	-3734.4	7668.7	7671.3	
ZINB	-3722.8	7647.6	7650.2	.11***
Hurdle Poisson	-3734.1	7668.1	7670.7	
Hurdle negative binomial	-3722.9	7647.7	7650.3	.11***
Father home practice				
Poisson	-3856.8	7891.6	7893.9	
Negative binomial	-3740.8	7661.6	7663.9	
ZIP	-3693.6	7587.2	7589.8	
ZINB	-3687.3	7576.7	7579.3	.09*
Hurdle Poisson	-3693.4	7586.9	7589.4	
Hurdle negative binomial	-3687.4	7576.9	7579.5	.09*
Father online usage				
Poisson	-5180.2	10538.3	10540.7	
Negative binomial	-3794.9	7769.9	7772.2	
ZIP	-4090.3	8380.6	8383.2	
ZINB	-3755.1	7712.2	7714.8	.51***
Hurdle Poisson	-4079.0	8357.9	8360.5	
Hurdle negative binomial	-3755.1	7712.2	7714.8	.51***
Mother attendance				
Poisson	-3025.3	6202.6	6208.6	
Negative binomial	-2957.4	6068.7	6074.8	
ZIP	-2918.7	6009.5	6016.3	
ZINB	-2910.7	5995.3	6002.2	.15**
Hurdle Poisson	-2918.5	6008.9	6015.7	
Hurdle negative binomial	-2907.1	5988.3	5995.2	.12**
Mother home practice				
Poisson	-2986.5	6125.0	6131.0	
Negative binomial	-2905.1	5964.1	5970.2	
ZIP	-2850.5	5873.0	5879.9	
ZINB	-2845.2	5864.4	5871.3	.08*
Hurdle Poisson	-2850.3	5872.7	5879.5	

Hurdle negative binomial	-2845.2	5864.4	5871.3	.08*
Mother online usage				
Poisson	-4256.3	8664.5	8670.6	
Negative binomial	-3097.1	6348.3	6354.4	
ZIP	-3397.9	6967.8	6974.6	
ZINB	-3032.1	6238.1	6245.1	.39***
Hurdle Poisson	-3385.1	6942.2	6949.0	
Hurdle negative binomial	-3032.1	6238.1	6245.0	.39***

Note. AIC = Akaike's Information Criteria; ABIC = Adjusted Bayesian Information Criteria; ZIP = zero-inflated Poisson; ZINB = zero-inflated negative binomial

† $p<.10$, * $p<.05$, ** $p<.01$, $^{***}p<.001$

Table 1.4

*Hurdle Negative Binomial Model for Number of Parent Sessions **Fathers** Attended*

Predictors	Logistic (Odds of attending at least 1 session)			Negative binomial (Frequency of sessions attended)		
	OR	*SE*	*P*-value	*RR*	*SE*	*P*-value
Child gender (female)	0.90	.146	.460	0.98	.253	.931
Child age	0.82 †	.117	.089	0.74	.336	.378
Child behavioral problems	1.02	.114	.845	2.04 **	.226	.002
Marital status (married)	0.96	.042	.279	0.98	.330	.954
Household income	1.20 *	.084	.028	0.74	.350	.391
Months deployed	1.21 *	.085	.025	0.70 †	.184	.057
Time since deployment	1.02	.116	.860	0.87	.316	.669
Mental health symptoms	1.05	.145	.719	0.63	.344	.173
Parent locus of control	1.02	.073	.822	1.12	.281	.690
Effective parenting	0.63 ***	.112	.000	1.29	.414	.535
Satisfaction at first session				1.03	.538	.950

Note. OR = odds ratio; RR = relative risk; SE = standard error. Model accounted for clustering effect of cohort. The signs of coefficients for the logistic step were reversed for interpretation purposes, because Mplus predicts the zero-class (i.e., never attended) as opposed to the non-zero class (i.e., attended at least one session). Standardized coefficients were used to calculate the odds ratios and relative risk estimates. † $p<.10$, * $p<.05$, ** $p<.01$, *** $p<.001$

Table 1.5

*Hurdle Negative Binomial Model for Number of Home Practice Assignments **Fathers** Completed*

Predictors	Logistic (Odds of completing at least 1 assignment)			Negative binomial (Frequency of assignments completed)		
	OR	*SE*	*P*-value	*RR*	*SE*	*P*-value
Child gender (female)	0.92	.155	.569	0.90	.296	.594
Child age	0.77 **	.088	.003	0.99	.334	.985
Child behavioral problems	1.09	.121	.464	1.43	.488	.465
Marital status (married)	0.95	.041	.191	1.10	.296	.737
Household income	1.21	.127	.139	0.64	.510	.382
Months deployed	1.19 †	.101	.085	0.78 ***	.136	.000
Time since deployment	1.01	.077	.893	0.75	.273	.299
Mental health symptoms	0.98	.080	.790	0.78	.306	.427
Parent locus of control	1.04	.074	.556	0.91	.296	.748
Effective parenting	0.71 ***	.089	.000	1.12	.415	.779
Satisfaction at first session				0.81	.413	.619

Note. OR = odds ratio; RR = relative risk; SE = standard error. Model accounted for the clustering effect of cohort. The signs of coefficients for the logistic step were reversed for interpretation purposes, because Mplus predicts the zero-class (i.e., never completed any home practice assignments) as opposed to the non-zero class (i.e., completed at least one home practice assignment). Standardized coefficients were used to calculate the odds ratios and relative risk estimates. † p<.10, * p<.05, ** p<.01, ***p<.001

Table 1.6

*Hurdle Negative Binomial Model for **Fathers'** Online Usage*

Predictors	Logistic (Odds of clicking on website at least once)			Negative binomial (Frequency of online usage)		
	OR	*SE*	*P*-value	*RR*	*SE*	*P*-value
Child gender (female)	0.89	.139	.386	0.81	.506	.683
Child age	0.96	.081	.579	1.88**	.198	.001
Child behavioral problems	0.98	.082	.800	0.85	.483	.742
Marital status (married)	0.99	.075	.980	0.62*	.198	.015
Household income	0.95	.093	.592	1.09	.707	.899
Months deployed	1.01	.091	.881	1.06	.580	.922
Time since deployment	0.99	.120	.956	1.39	.541	.545
Mental health symptoms	1.02	.079	.814	0.80	.229	.336
Parent locus of control	1.05	.093	.589	0.95	.717	.942
Effective parenting	1.06	.097	.540	0.96	.294	.987

Note. OR = odds ratio; RR = relative risk; SE = standard error. Model accounted for the clustering effect of cohort. The signs of coefficients for the logistic step were reversed for interpretation purposes, because Mplus predicts the zero-class (i.e., never completed any home practice assignments) as opposed to the non-zero class (i.e., completed at least one home practice assignment). Standardized coefficients were used to calculate the odds ratios and relative risk estimates. † p<.10, * p<.05, ** p<.01, ***p<.001

Table 1.7

*Hurdle Negative Binomial Model for Number of Parent Session **Mothers** Attended*

Predictors	Logistic (Odds of attending at least 1 session)			Negative binomial (Frequency of sessions attended)		
	OR	*SE*	*P*-value	*RR*	*SE*	*P*-value
Child gender (female)	0.97	.107	.805	1.10	.140	.518
Child age	0.83	.137	.184	0.68	.269	.155
Child behavioral problems	1.12	.073	.127	1.28	.183	.183
Marital status (married)	0.97	.052	.550	1.51	.255	.105
Household income	1.17	.124	.211	1.10	.193	.606
Months deployed	0.95	.092	.560	1.02	.276	.931
Mental health symptoms	0.85 *	.063	.012	1.14	.163	.417
Parental locus of control	0.81 **	.065	.001	0.84	.289	.535
Effective parenting	0.83	.123	.129	1.28	.181	.166
Satisfaction at first session				2.13***	.200	.000

Note. OR = odds ratio; RR = relative risk; SE = standard error. Model accounted for clustering effect of cohort. The signs of coefficients for the logistic step were reversed for interpretation purposes, because Mplus predicts the zero-class (i.e., never attended any sessions) as opposed to the non-zero class (i.e., attended at least one session). Standardized coefficients were used to calculate the odds ratios and relative risk estimates. † p<.10, * p<.05, ** p<.01, ***p<.001

Table 1.8

*Hurdle Negative Binomial Model for Number of Home Practice Assignments **Mothers** Completed*

Predictors	Logistic (Odds of completing at least 1 assignment)			Negative binomial (Frequency of assignments completed)		
	OR	*SE*	*P*-value	*RR*	*SE*	*P*-value
Child gender (female)	1.02	.090	.798	0.89	.258	.649
Child age	0.78 *	.114	.028	0.83	.335	.574
Child behavioral problems	1.15 †	.075	.056	0.98	.283	.950
Marital status (married)	0.96	.056	.495	1.64 *	.218	.023
Household income	1.23	.133	.120	0.78	.214	.252
Months deployed	0.93	.090	.399	1.02	.352	.964
Mental health symptoms	0.84 *	.073	.018	1.19	.347	.614
Parent locus of control	0.74 **	.114	.009	1.13	.155	.424
Effective parenting	0.87	.135	.322	1.37 *	.158	.047
Satisfaction at first session				2.08 **	.241	.002

Note. OR = odds ratio; RR = relative risk; SE = standard error. Model accounted for clustering effect of cohort. The signs of coefficients for the logistic step were reversed for interpretation purposes, because Mplus predicts the zero-class (i.e., never completed any home practice assignments) as opposed to the non-zero class (i.e., completed at least one home practice assignment). Standardized coefficients were used to calculate the odds ratios and relative risk estimates. † p<.10, * p<.05, ** p<.01, ***p<.001

Table 1.9

*Hurdle Negative Binomial Model for **Mothers'** Online Usage*

Predictors	Logistic (Odds of clicking on website at least once)			Negative binomial (Frequency of online usage)		
	OR	*SE*	*P*-value	*RR*	*SE*	*P*-value
Child gender (female)	1.11	.077	.167	0.65	.281	.128
Child age	1.05	.078	.545	1.38	.429	.449
Child behavioral problems	0.90	.097	.301	1.29	.286	.379
Marital status (married)	1.08	.112	.487	0.70 *	.181	.046
Household income	1.08	.076	.300	1.47	.323	.230
Months deployed	0.98	.055	.827	0.61	.309	.115
Mental health symptoms	0.97	.075	.661	1.32	.357	.434
Parent locus of control	0.78 **	.070	.001	0.75	.250	.258
Effective parenting	0.97	.102	.769	0.93	.556	.899

Note. OR = odds ratio; RR = relative risk; SE = standard error. Model accounted for clustering effect of cohort. The signs of coefficients for the logistic step were reversed for interpretation purposes, because Mplus predicts the zero-class (i.e., never completed any home practice assignments) as opposed to the non-zero class (i.e., completed at least one home practice assignment). Standardized coefficients were used to calculate the odds ratios and relative risk estimates. † p<.10, * p<.05, ** p<.01, ***p<.001

Table 2.1

*Means, Standard Deviations, and Bivariate Correlations between **Mothers'** Study Variables*

Measure	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. BL PS	2.56	0.67																		
2. BL HD	1.37	0.43	-.31***																	
3. BL PI	3.49	0.47	.54***	-.44***																
4. BL Mon	3.69	0.78	.09	-.25***	.24***															
5. BL ENC	2.66	0.70	.19**	-.20**	.46***	.31***														
6. 12M PS	2.97	0.69	.33***	-.16*	.19**	.04	.13†													
7. 12M HD	1.25	0.37	-.26***	.33***	-.29***	.08	-.11†	-.31***												
8. 12M PI	3.67	0.48	.27***	-.22**	.34***	.05	.32***	.54***	-.30***											
9. 12M Mon	3.62	0.74	-.01	.003	.04	.11	.20**	.11	-.004	.21**										
10. 12M ENC	2.62	0.67	.01	-.001	.14*	.09	.36***	.13†	.07	.50***	.21**									
11. BL PLOC	3.62	0.42	.15*	-.05	.12*	-.06	-.05	.01	-.19**	.03	.01	-.07								
12. 12M PLOC	3.71	0.42	.02	.001	.03	-.05	-.08	.10	-.08	.12†	-.01	.03	.66***							
13. Child gender	1.54	0.50	.07	-.01	.03	-.05	.01	.001	-.05	-.04	-.06	.05	.05	.01						
14. Child age	8.36	2.48	.19**	-.16**	-.10†	-.06	-.24***	-.08	.06	-.20**	-.18**	-.31***	.15*	.13*	-.03					
15. Child BSI	49.60	10.19	-.11†	.03	-.10†	-.03	-.03	-.12†	.22**	-.09	-.10	.004	-.43***	-.34***	-.11†	.02				
16. Income	8.38	3.67	.15**	-.17**	.23***	.08	.11†	-.02	-.12†	.15*	-.01	-.03	.09	.07	-.02	.13*	-.10†			
17. Marital status	1.88	0.32	.24***	-.26***	.22***	.08	.03	.15*	-.23***	.11†	-.03	-.04	.11†	.03	.07	.03	-.10†	.23***		
18. Months deploy	0.49	1.21	-.09	.08	-.08	.01	-.02	.06	.05	.06	-.07	.03	-.05	.04	.01	-.01	.09	-.09	-.35***	
19. Mental health symptoms	1.51	0.42	-.03	.02	-.05	-.09	.01	-.07	.09	-.01	-.06	.03	-.18**	-.18**	-.03	-.11†	.37***	-.16**	-.19**	.25***

Note. Child gender was coded 1 (*male*) and 2 (*female*) and marital status was coded 1 (*single*) and 2 (*married*). BL = baseline, PS = problem-solving, HD = harsh discipline, PI = positive involvement, MON = monitoring, ENC = encouragement, 12M = 12-month follow-up, BSI = behavioral severity index, PLOC = parental locus of control; † p<.10, * p<.05, ** p<.01, ***p<.001

Table 2.2

*Means, Standard Deviations, and Bivariate Correlations between **Fathers**' Study Variables*

Measure	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. BL PS	2.50	0.62																			
2. BL HD	1.30	0.36	-.26***																		
3. BL PI	3.39	0.53	.47***	-.29***																	
4. BL Mon	3.15	0.94	.10	-.11†	.39***																
5. BL ENC	2.70	0.77	.23***	-.15*	.62***	.37***															
6. 12M PS	2.81	0.66	.26***	-.06	.25***	.16*	.16*														
7. 12M HD	1.23	0.38	-.16*	.29***	-.25***	-.07	-.18*	-.26***													
8. 12M PI	3.54	0.53	.24**	-.09	.42***	.29***	.34***	.54***	-.51***												
9. 12M Mon	3.20	0.84	.05	-.11	.21**	.30***	.18*	.11	-.30***	.30***											
10. 12M ENC	2.64	0.64	.03	.01	.31***	.26***	.47***	.28***	-.23**	.52***	.26***										
11. BL PLOC	3.67	0.39	.15*	-.07	.15*	.01	.06	.04	-.06	.05	-.05	.05									
12. 12M PLOC	3.74	0.45	.10	-.08	.21**	.12	.13†	.20**	-.11	.14†	.09	.11	.67***								
13. Child gender	1.54	0.50	.07	-.12*	.03	-.06	-.02	-.01	-.10	.03	-.04	-.01	.03	.03							
14. Child age	8.49	2.56	.08	-.08	-.13*	-.04	-.17**	-.02	-.01	-.11	-.08	-.21**	.13*	.09	-.01						
15. Child BSI	50.53	9.65	-.13*	.04	-.09	-.04	-.07	-.18*	.06	-.09	-.06	-.02	-.38***	-.35***	-.05	-.10†					
16. Income	8.56	3.61	.10	-.04	.17**	.08	.14*	.01	-.14*	.13†	.14*	.09	.04	.10	-.01	.11†	-.11†				
17. Marital status	1.89	0.31	.10†	.12*	.003	-.09	-.07	.05	-.05	-.02	.03	-.03	-.03	-.08	.09	-.06	-.10	.21**			
18. Months deploy	3.65	1.95	-.08	.06	-.09	.03	.07	.004	.06	-.04	.03	.07	.08	-.03	.01	.09	-.04	-.08	-.01		
19. Time since deployment	33.16	30.77	.09	.02	-.01	.02	-.05	.06	.06	-.02	.04	.01	-.09	-.05	-.07	.01	-.09	.13*	-.09	-.24***	
20. Mental health problems	0.36	0.27	.01	-.03	-.07	-.07	-.05	-.11	.19**	-.16*	-.13	-.13†	-.30***	-.21**	.10	.01	.23***	-.11†	-.12*	.01	.13*

Note. Child gender was coded 1 (*male*) and 2 (*female*) and marital status was coded 1 (*single*) and 2 (*married*). BL = baseline, PS = problem-solving, HD = harsh discipline, PI = positive involvement, MON = monitoring, ENC = encouragement, M = months, BSI = behavioral severity index, PLOC = parental locus of control; † p<.10, * p<.05, ** p<.01, ***p<.001

Table 2.3

*CACE Models Predicting **Fathers'** Parental Locus of Control and Effective Parenting at 12-Month Follow-up*

	Fathers' Parental Locus of Control Compliance = Attend > 4 sessions		Fathers' Effective Parenting Compliance = Attend > 4 sessions	
	β	*SE*	β	*SE*
CACE estimate	.10*	.04	.22†	.13
Predictors of engagement	*OR*	*SE*	*OR*	*SE*
Child age	0.89	.07	0.89	.09
Child gender (female)	0.67	.48	0.71	.52
Child behavioral problems	1.04†	.02	1.03	.02
Household income	1.01	.04	1.02	.03
Marital Status (married)	1.49	.62	1.30	.53
Months deployed	1.18	.12	1.10	.10
Time since deployment	1.05	.07	1.01	.07
Mental health symptoms	1.05	.40	0.61	.67
Parental locus of control	1.41	.35		
Effective parenting			0.92*	.44
Most likely class membership	(*n* = 184) 62.6%		(*n* = 185) 62.9%	
Entropy	0.65		0.66	

Table 2.4

*CACE Models Predicting **Mothers'** Parental Locus of Control and Effective Parenting at 12-Month Follow-up*

	Mothers' Parental Locus of Control Compliance = Attend > 4 sessions		Mothers' Effective Parenting Compliance = Attend > 4 sessions	
	β	*SE*	β	*SE*
CACE estimate	.14**	.05	.25*	.11
Predictors of engagement	*OR*	*SE*	*OR*	*SE*
Child age	0.84†	.10	0.85†	.09
Child gender (female)	0.84	.36	0.80	.43
Child behavioral problems	1.05**	.02	1.07***	.01
Household income	1.06	.05	1.04	.06
Marital status (married)	0.81	.53	0.74	.47
Months deployed	0.93	.17	0.96	.14
Mental health symptoms	0.60	.37	0.60†	.28
Parental locus of control	0.51	.44		
Effective parenting			1.37	.45
Most likely class membership	(*n* =214) 68.2%		(*n* = 218) 69.4%	
Entropy	0.66		0.67	

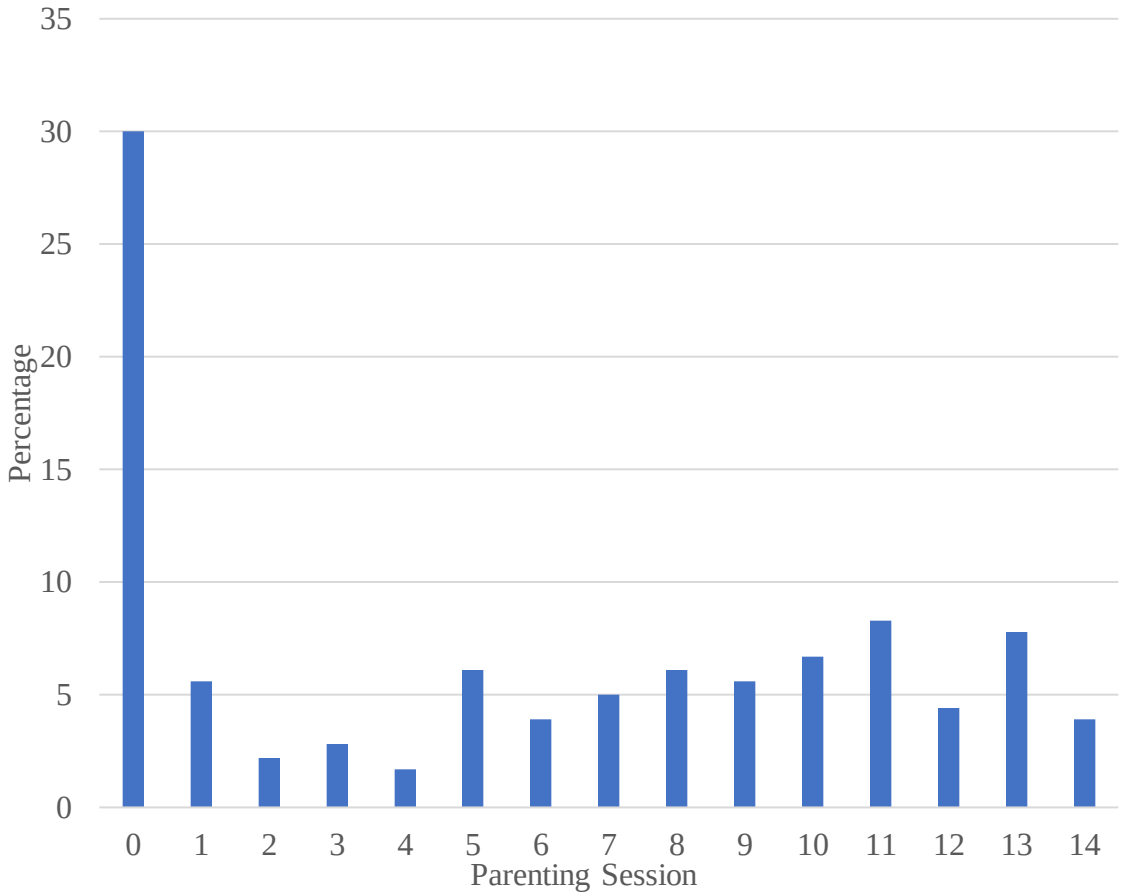

Figure 1.1 Histogram of Fathers' Attendance at ADAPT Parenting Sessions (N = 180)

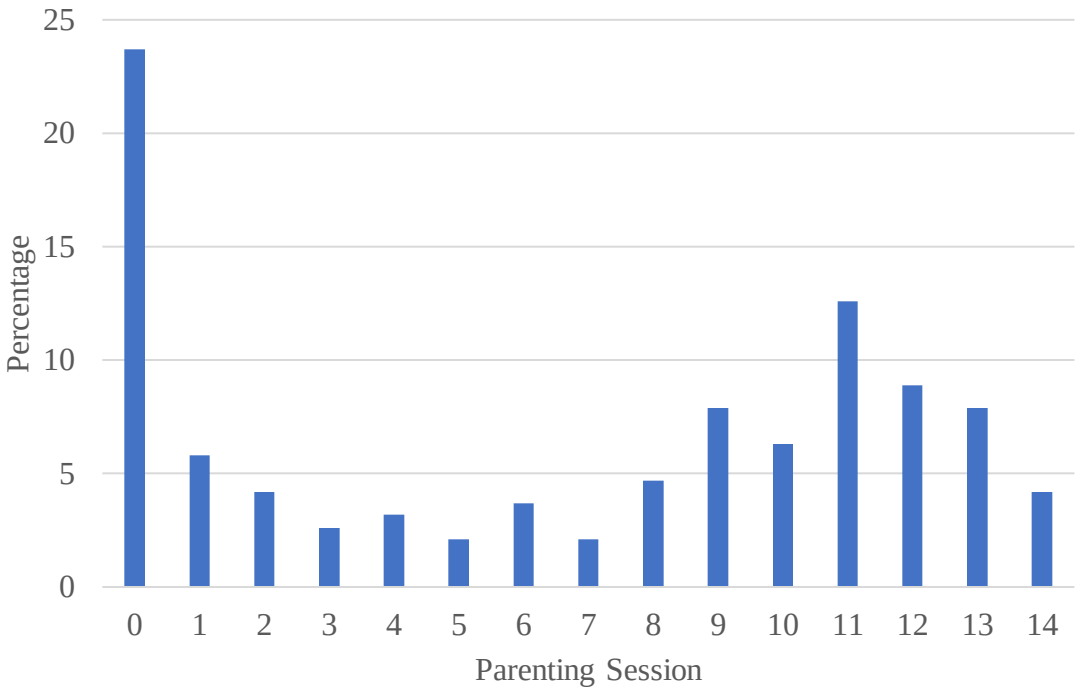

Figure 1.2 Histogram of Mothers' Attendance at ADAPT Parenting Sessions (N = 190)

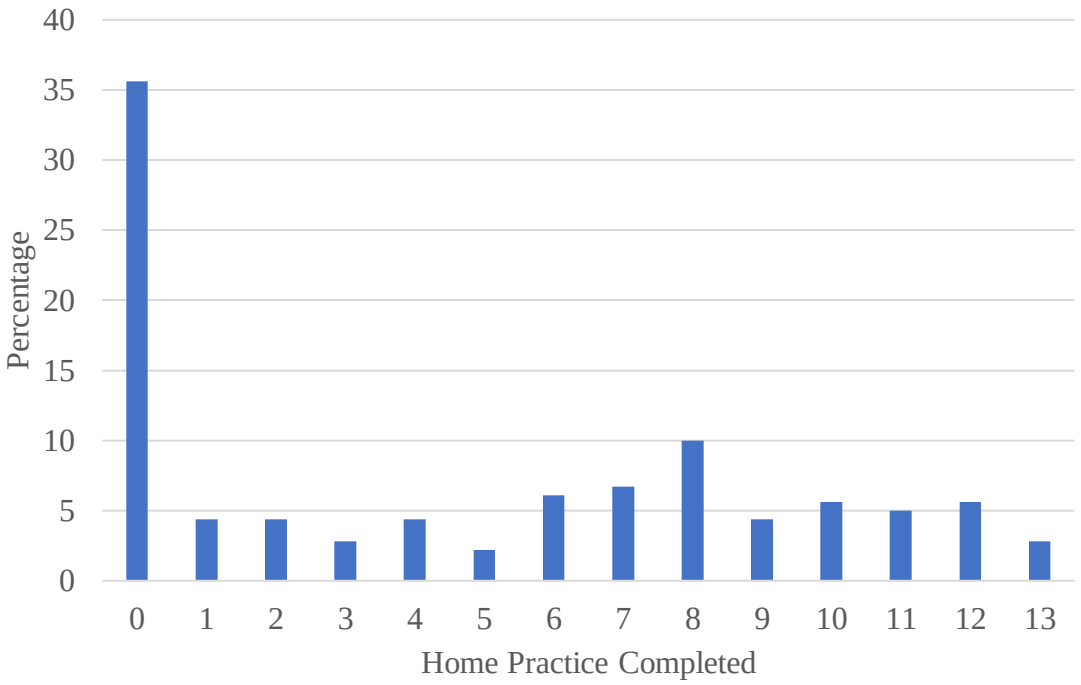

Figure 1.3 Histogram of Fathers' Home Practice Completion (N = 180)

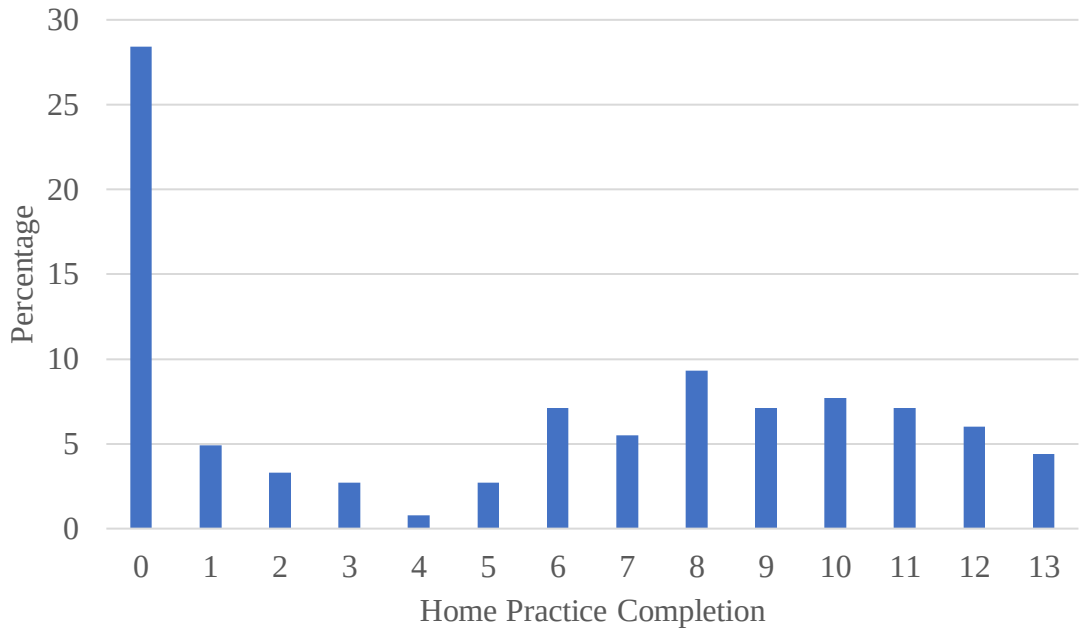

Figure 1.4 Histogram of Mothers' Home Practice Completion (N = 190)

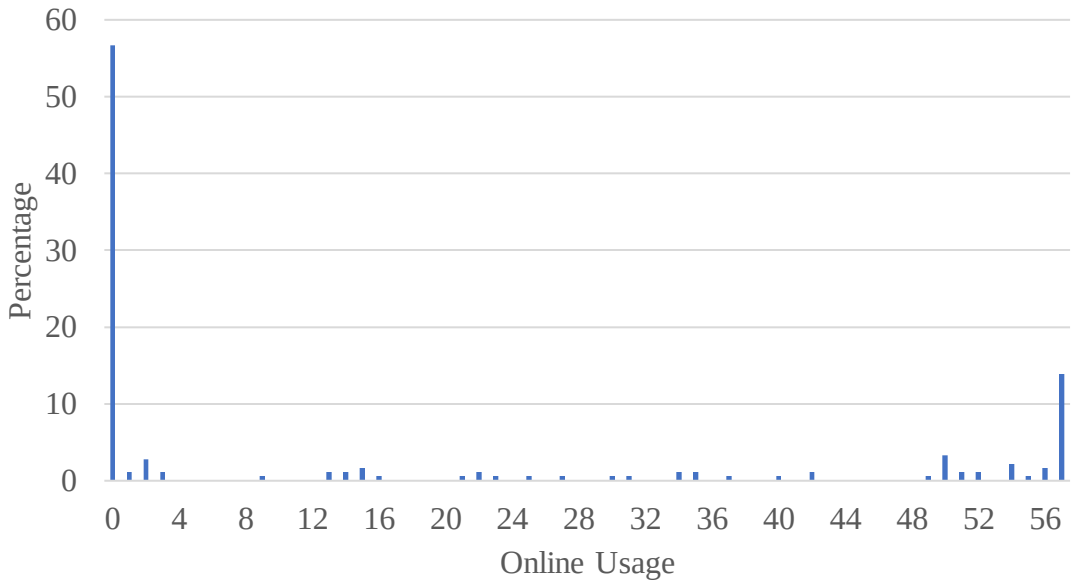

Figure 1.5 Histogram of Fathers' Online Usage (N = 180)

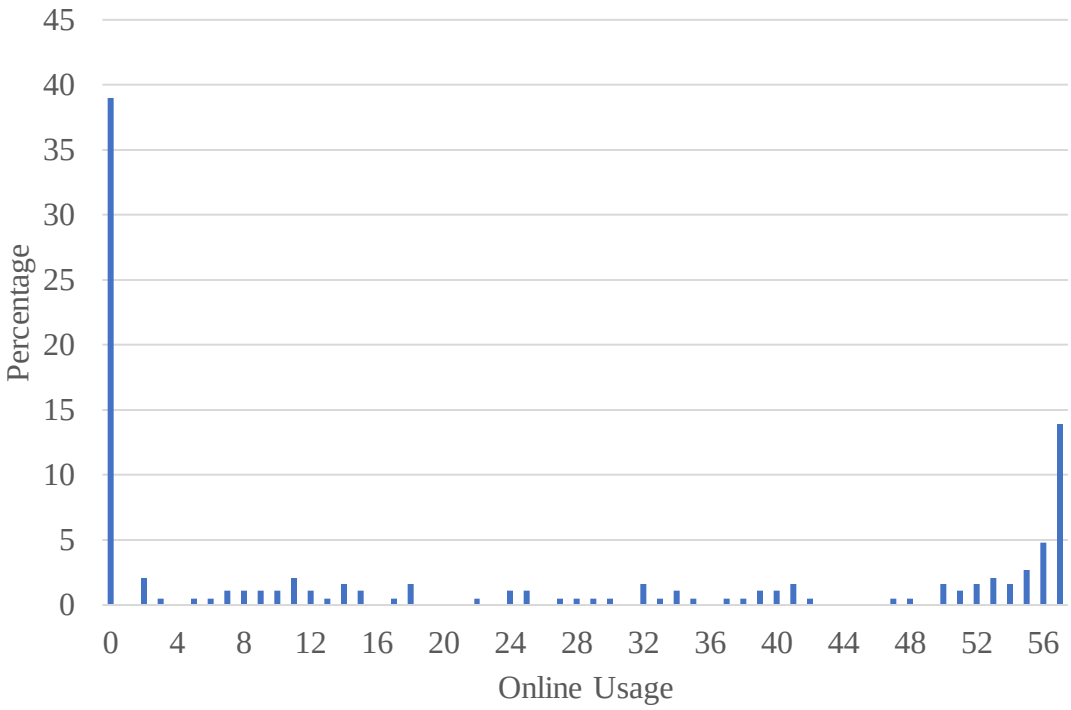

Figure 1.6 Histogram of Mothers' Online Usage (N = 190)

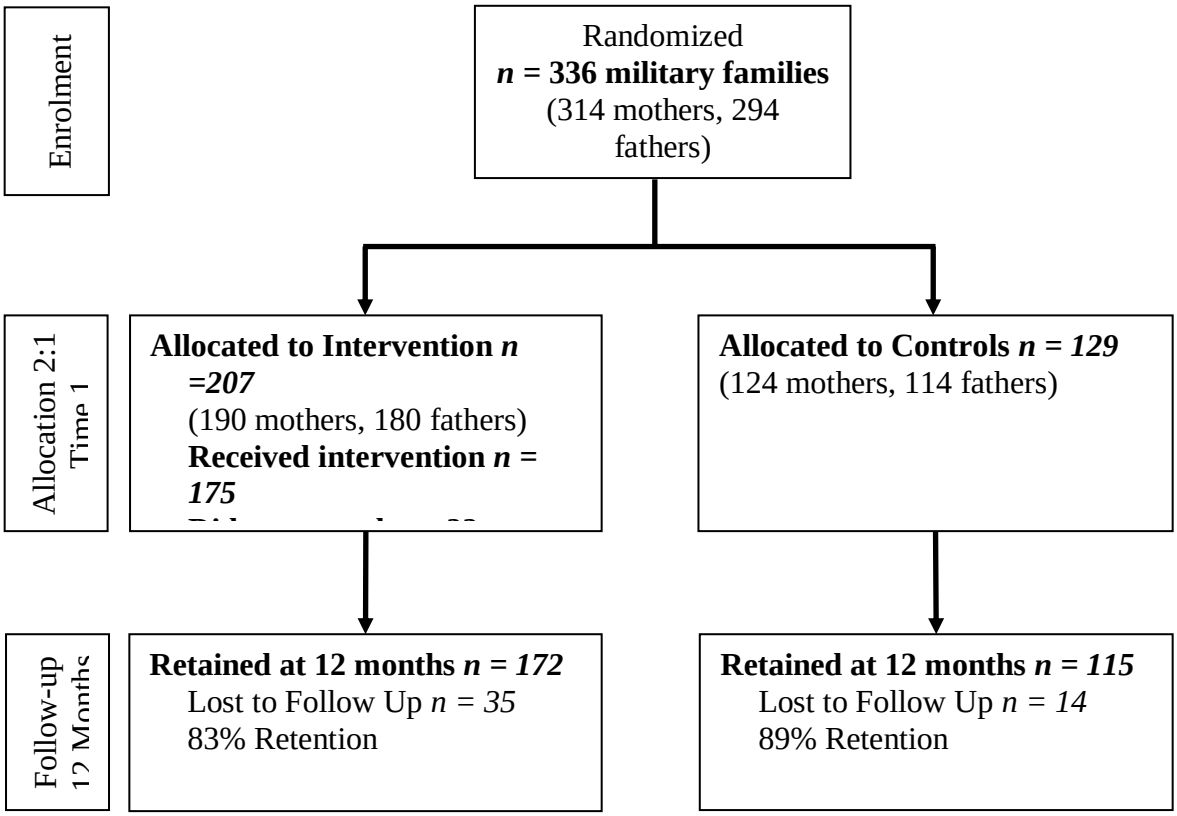

Figure 2.1

CONSORT Flow Chart of ADAPT Randomized Control Trial and 12-Month Data in Present Study

References

Acion, L., Ramirez, M. R., Jorge, R. E., & Arndt, S. (2013). Increased risk of alcohol and drug use among children from deployed military families. *Addiction*, *108,* 1418-1425.

Alfano, C. A., Lau, S., Balderas, J., Bunnell, B. E., & Beidel, D. C. (2016). The impact of military deployment on children: Placing developmental risk in context. *Clinical Psychology Review*, *43,* 17-29.

Amato, P. R., & Rivera, F. (1999). Paternal involvement and children's behavior problems. *Journal of Marriage and the Family*, 61, 375-384.

Bagner, D. M. (2013). Father's role in parent training for children with developmental delay. *Journal of Family Psychology, 27,* 650–657.

Bagner, D. M., & Eyberg, S. M. (2003). Father involvement in parent training: When does it matter? *Journal of Clinical Child and Adolescent Psychology*, *32*, 599-605.

Baker, C. N., Arnold, D. H., & Meagher, S. (2011). Enrollment and attendance in a parent training prevention program for conduct problems. *Prevention Science, 12,* 126-138.

Baydar, N., Reid, M. J., & Webster-Stratton, C. (2003). The role of mental health factors and program engagement in the effectiveness of a preventive parenting program for Head Start mothers. *Child Development*, *74*, 1433-1453.

Berkel, C., Mauricio, A. M., Schoenfelder, E., & Sandler, I. N. (2011). Putting the pieces together: An integrated model of program implementation. *Prevention Science*, *12*, 23-33.

Berkel, C., Sandler, I. N., Wolchik, S. A., Brown, C. H., Gallo, C. G., Chiapa, A., ... & Jones, S. (2016). "Home Practice Is the Program": Parents' Practice of Program Skills as Predictors of Outcomes in the New Beginnings Program Effectiveness Trial. *Prevention Science*, 1-11.

Bögels, S. M., & Melick, M. (2004). The relationship between child- report, parent self-report, and partner report of perceived parental rearing behaviors and anxiety in children and parents. *Personality and Individual Differences*, *37*, 1583–1596.

Bullard, L., Wachlarowicz, M., DeLeeuw, J., Snyder, J., Low, S., Forgatch, M., & DeGarmo, D. (2010). Effects of the Oregon model of Parent Management Training (PMTO) on marital adjustment in new stepfamilies: A randomized trial. *Journal of Family Psychology*, *24*, 485-496. https://doi.org/10.1037/a0020267

Burbach, A. D., Fox, R. A., & Nicholson, B. C. (2004). Challenging behaviors in young children: The father's role. *The Journal of Genetic Psychology*, *165*, 169-189.

Cameron, A.C. & Trivedi, P.K. (2005). Models of Count Data. *Microeconometrics: Methods and Applications (pp. 665-696)*. New York, NY: Cambridge University Press.

Campis, L. K., Lyman, R. D., & Prentice-Dunn, S. (1986). The parental locus of control scale: Development and validation. *Journal of Clinical Child Psychology*, *15*, 260-267.

Chacko, A., Jensen, S. A., Lowry, L. S., Cornwell, M., Chimklis, A., Chan, E., ... & Pulgarin, B. (2016). Engagement in behavioral parent training: Review of the literature and implications for practice. *Clinical Child and Family Psychology Review*, *19*, 204-215.

Chacko, A., Wymbs, B. T., Rajwan, E., Wymbs, F., & Feirsen, N. (2017). Characteristics of Parents of Children with ADHD Who Never Attend, Drop Out, and Complete Behavioral Parent Training. *Journal of Child and Family Studies*, *26*, 950-960.

Chartrand, M. M., Frank, D. A., White, L. F., & Shope, T. R. (2008). Effect of parents' wartime deployment on the behavior of young children in military families. *Archives of Pediatrics & Adolescent Medicine*, *162*, 1009-1014.

Chesmore, A. A., He, Y., Zhang, N., & Gewirtz, A. H. (2018). Parent Discrepancies in Ratings of Child Behaviors Following Wartime Deployment. *Journal of Traumatic Stress*, *31*, 79-88.

Chesmore, A. A., Piehler, T. F., & Gewirtz, A. H. (2018). PTSD as a moderator of a parenting intervention for military families. *Journal of Family Psychology, 32*, 123-133.

Coatsworth, J. D., Hemady, K. T., & George, M. W. (2017). Predictors of Group Leaders' Perceptions of Parents' Initial and Dynamic Engagement in a Family Preventive Intervention. *Prevention Science*, 1-11.

Conger, R. D., Wallace, L. E., Sun, Y., Simons, R. L., McLoyd, V. C., & Brody, G. H. (2002). Economic pressure in African American families: a replication and extension of the family stress model. *Developmental Psychology*, *38*, 179-193.

Connell, A. M., McKillop, H. N., & Dishion, T. J. (2016). Long-Term Effects of the Family Check-Up in Early Adolescence on Risk of Suicide in Early Adulthood. *Suicide and Life-threatening Behavior*, *46*, 15-22.

Connell, S., Sanders, M. R., & Markie-Dadds, C. (1997). Self-directed behavioral family intervention for parents of oppositional children in rural and remote areas. *Behavior Modification*, *21*, 379-408.

Cook, W. L., & Kenny, D. A. (2005). The actor–partner interdependence model: A model of bidirectional effects in developmental studies. *International Journal of Behavioral Development*, *29*, 101-109.

Cowan, P. A., Cowan, C. P., Pruett, M. K., Pruett, K., & Wong, J. J. (2009). Promoting fathers' engagement with children: preventive interventions for low-income families. *Journal of Marriage and Family*, *71*, 663-679.

Creech, S. K., Hadley, W., & Borsari, B. (2014). The impact of military deployment and reintegration on children and parenting: A systematic review. *Professional Psychology: Research and Practice*, *45*, 452-464.

Defense Manpower Data Center. (2015). Military Family Life Project: Active Duty Spouse Study, Longitudinal Analyses 2010-2012. Alexandria, VA: Defense Manpower Data Center. Retrieved from: http://download.militaryonesource.mil/12038/MOS/Reports/MFLPLongitudinal-Analyses-Report.pdf

DeGarmo, D. S., & Forgatch, M. S. (2007). Efficacy of parent training for stepfathers: From playful spectator and polite stranger to effective stepfathering. *Parenting: Science and Practice*, *7*, 331-355.

DeGarmo, D. S., & Forgatch, M. S. (2012). A confidant support and problem solving model of divorced fathers' parenting. *American Journal of Community Psychology, 49,* 258-269.

Derogatis, L. R., Lipman, R. S., Rickels, K., Uhlenhuth, E. H., & Covi, L. (1974). The Hopkins Symptom Checklist (HSCL): A self-report symptom inventory. *Behavioral Science, 19,* 1-15.

Dishion, T. J., Brennan, L. M., Shaw, D. S., McEachern, A. D., Wilson, M. N., & Jo, B. (2014). Prevention of problem behavior through annual family check-ups in early childhood: Intervention effects from home to early elementary school. *Journal of Abnormal Child Psychology, 42,* 343-354.

Doty, J. L., Rudi, J. H., Pinna, K. L., Hanson, S. K., & Gewirtz, A. H. (2016). If You Build It, Will They Come? Patterns of Internet-Based and Face-To-Face Participation in a Parenting Program for Military Families. *Journal of Medical Internet Research, 18,* 1-32.

Dumas, J. E., Nissley-Tsiopinis, J., & Moreland, A. D. (2007). From intent to enrollment, attendance, and participation in preventive parenting groups. *Journal of Child and Family Studies, 16,* 1-26.

Durlak, J. A. & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and factors affecting implementation. *American Journal of Community Psychology, 41,* 327-350.

Epstein, R. A., Fonnesbeck, C., Potter, S., Rizzone, K. H., & McPheeters, M. (2015). Psychosocial interventions for child disruptive behaviors: A meta-analysis. *Pediatrics, 136,* 948-960.

Faber, A. J., Willerton, E., Clymer, S. R., MacDermid, S. M., & Weiss, H. M. (2008). Ambiguous absence, ambiguous presence: a qualitative study of military reserve families in wartime. *Journal of Family Psychology*, *22*, 222.

Flake, E. M., Davis, B. E., Johnson, P. L., & Middleton, L. S. (2009). The psychosocial effects of deployment on military children. *Journal of Developmental & Behavioral Pediatrics*, *30*, 271-278.

Fleming, C. B., Mason, W. A., Haggerty, K. P., Thompson, R. W., Fernandez, K., Casey-Goldstein, M., & Oats, R. G. (2015). Predictors of participation in parenting workshops for improving adolescent behavioral and mental health: Results from the Common Sense Parenting trial. *The Journal of Primary Prevention*, *36*, 105-118.

Fletcher, R., Freeman, E., & Matthey, S. (2011). The impact of behavioral parent training on fathers' parenting: A meta-analysis of the Triple P-Positive Parenting program. *Fathering*, *9*, 291-312.

Forgatch, M. S. (1994). Parenting through change: A programmed intervention curriculum for groups of single mothers. Oregon Social Learning Center: Eugene, OR. Unpublished manuscript.

Forgatch, M. S., & DeGarmo, D. S. (1999). Parenting through change: An effective prevention program for single mothers. *Journal of Consulting and Clinical Psychology*, *67*, 711-724.

Forgatch, M. S., & Gewirtz, A. H. (2017). The evolution of the Oregon Model of Parent Management Training: An intervention for antisocial behavior in children and adolescents. In J. R. Weisz and A. E. Kazdin (Eds.), *Evidence-Based*

Psychotherapies for Children and Adolescents 3rd Edition (pp. 85-102). New York, NY: Guilford Publications.

Forgatch, M. S., Knutson, N., & Mayne, T. (1992). Coder impressions of ODS lab tasks. Eugene, OR: Oregon Social Learning Center.

Forgatch, M. S., Patterson, G. R., DeGarmo, D. S., & Beldavs, Z. G. (2009). Testing the Oregon delinquency model with 9-year follow-up of the Oregon Divorce Study. *Development and Psychopathology*, *21*, 637-660.

Forgatch, M. S., & Patterson, G. R. (2010). Parent Management Training—Oregon Model: An intervention for antisocial behavior in children and adolescents. *Evidence-based Psychotherapies for Children and Adolescents*, *2*, 159-178.

Fox, D. P., & Gottfredson, D. C. (2003). Differentiating completers from non-completers of a family-based prevention program. *Journal of Primary Prevention*, *24*, 111-124.

Freed, R. D., & Tompson, M. C. (2011). Predictors of parental locus of control in mothers of pre-and early adolescents. *Journal of Clinical Child & Adolescent Psychology*, *40*, 100-110.

Friars, P. M., & Mellor, D. J. (2007). Drop out from behavioral management training programs for ADHD: A prospective study. *Journal of Child and Family Studies, 16*, 427-441.

Garvey, C., Julion, W., Fogg, L., Kratovil, A., & Gross, D. (2006). Measuring participation in a prevention trial with parents of young children. *Research in Nursing and Health, 29*, 212-222.

Gewirtz, A., & Davis, L. (2014). Parenting practices and emotion regulation in National

Guard and Reserve families: Early findings from the After Deployment Adaptive Parenting Tools/ADAPT study. In *Military deployment and its consequences for families* (pp. 111-131). Springer, New York, NY.

Gewirtz, A. H., DeGarmo, D. S., Lee, S., Morrell, N., & August, G. (2015). Two-year outcomes of the Early Risers prevention trial with formerly homeless families residing in supportive housing. *Journal of Family Psychology*, *29*, 242-252.

Gewirtz, A. H., DeGarmo, D. S., & Zamir, O. (2016). Effects of a military parenting program on parental distress and suicidal ideation: After deployment adaptive parenting tools. *Suicide and Life-Threatening Behavior*, *46*, S23-S31.

Gewirtz, A. H., DeGarmo, D. S., & Zamir, O. (2017). After deployment, adaptive parenting tools: One-year outcomes of an evidence-based parenting program for military families following deployment. *Prevention Science*, 1-11.

Gewirtz, A., Forgatch, M., & Wieling, E. (2008). Parenting practices as potential mechanisms for child adjustment following mass trauma. *Journal of Marital and Family Therapy*, *34*, 177-192.

Gewirtz, A. H., Pinna, K. L., Hanson, S. K., & Brockberg, D. (2014). Promoting parenting to support reintegrating military families: after deployment, adaptive parenting tools. *Psychological Services*, *11*, 31-40.

Gewirtz, A. H., Polusny, M. A., DeGarmo, D. S., Khaylis, A., & Erbes, C. R. (2010). Posttraumatic stress symptoms among National Guard soldiers deployed to Iraq: Associations with parenting behaviors and couple adjustment. *Journal of Consulting and Clinical Psychology, 78*, 599-610.

Gibbs, D. A., Martin, S. L., Kupper, L. L., & Johnson, R. E. (2007). Child maltreatment

in enlisted soldiers' families during combat-related deployments. *JAMA*, *298*, 528-535.

Gilreath, T. D., Cederbaum, J. A., Astor, R. A., Benbenishty, R., Pineda, D., & Atuel, H. (2013). Substance use among military-connected youth: The California healthy kids survey. *American Journal of Preventive Medicine*, *44*, 150-153.

Gorman-Smith, D., Tolan, P. H., Henry, D. B., Leventhal, A., Schoeny, M., Lutovsky, K., & Quintana, E. (2002). Predictors of participation in a family-focused preventive intervention for substance use. *Psychology of Addictive Behaviors*, *16*, S55.

Gross, D., Julion, W., & Fogg, L. (2001). What motivates participation and dropout among low-income urban families of color in a prevention intervention? *Family Relations*, *50*, 246-254.

Haggerty, K. P., Fleming, C. B., Lonczak, H. S., Oxford, M. L., Harachi, T. W., & Catalano, R. F. (2002). Predictors of participation in parenting workshops. *Journal of Primary Prevention*, *22*, 375-387.

Hale, D. R., & Viner, R. M. (2012). Policy responses to multiple risk behaviours in adolescents. *Journal of Public Health*, *34*, i11-i19.

Hassall, R., Rose, J., & McDonald, J. (2005). Parenting stress in mothers of children with an intellectual disability: The effects of parental cognitions in relation to child characteristics and family support. *Journal of Intellectual Disability Research*, *49*, 405-418.

Harpaz-Rotem, I., Leslie, D., & Rosenheck, R. A. (2004). Treatment retention among children entering a new episode of mental health care. *Psychiatric Services*, *55*,

1022-1028.

Henson, J. M., Reise, S. P., & Kim, K. H. (2007). Detecting mixtures from structural model differences using latent variable mixture modeling: A comparison of relative model fit statistics. *Structural Equation Modeling: A Multidisciplinary Journal*, *14*, 202-226.

Hosek, J., Kavanagh, J. E., & Miller, L. L. (2006). *How deployments affect service members*. Santa Monica, CA: Rand Corporation.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*, 1-55.

Jacobson, I. G., Ryan, M. A., Hooper, T. I., Smith, T. C., Amoroso, P. J., Boyko, E. J., ... & Bell, N. S. (2008). Alcohol use and alcohol-related problems before and after military combat deployment. *JAMA*, *300*, 663-675.

Jo, B. (2002). Estimation of intervention effects with noncompliance: Alternative model specifications. *Journal of Educational and Behavioral Statistics*, *27*, 385-409.

Johnson, D. R., & Young, R. (2011). Toward best practices in analyzing datasets with missing data: Comparisons and recommendations. *Journal of Marriage and Family*, *73*, 926-945.

Johnston, C., Mah, J. W., & Regambal, M. (2010). Parenting cognitions and treatment beliefs as predictors of experience using behavioral parenting strategies in families of children with attention-deficit/hyperactivity disorder. *Behavior Therapy*, *41*, 491-504.

Kazdin, A. E., Mazurick, J. L., & Bass, D. (1993). Risk for attrition in treatment of

antisocial children and families. *Journal of Clinical Child Psychology*, *22*, 2-16.

Keller, J., & McDade, K. (2000). Attitudes of low-income parents toward seeking help with parenting: Implications for practice. *Child Welfare, 79*, 285-312.

Kotila, L. E., Schoppe-Sullivan, S. J., & Kamp Dush, C. M. (2013). Time in parenting activities in dual-earner families at the transition to parenthood. *Family Relations*, *62*, 795-807.

Lamb, M. E., & Lewis, C. (2013). Father-child relationships. In N. J. Cabrera and C. S. Tamis-LeMonda (Eds) *Handbook of father involvement: Multidisciplinary perspectives* 2nd Edition (pp. 119-135). New York, NY: Routledge.

Lester, P., Saltzman, W. R., Woodward, K., Glover, D., Leskin, G. A., Bursch, B., ... & Beardslee, W. (2012). Evaluation of a family-centered prevention intervention for military children and families facing wartime deployments. *American Journal of Public Health*, *102*, S48-S54.

Lundahl, B. W., Tollefson, D., Risser, H., & Lovejoy, M. (2008). A meta-analysis of father involvement in parent training. *Research on Social Work Practice, 18*, 97–106.

Mah, J. W., & Johnston, C. (2008). Parental social cognitions: Considerations in the acceptability of and engagement in behavioral parent training. *Clinical Child and Family Psychology Review*, *11*, 218-236.

Mansfield, A. J., Kaufman, J. S., Marshall, S. W., Gaynes, B. N., Morrissey, J. P., & Engel, C. C. (2010). Deployment and the use of mental health services among US Army wives. *New England Journal of Medicine*, *362*, 101-109.

Mendez, J. L., Carpenter, J. L., LaForett, D. R., & Cohen, J. S. (2009). Parental

engagement and barriers to participation in a community-based preventive intervention. *American Journal of Community Psychology*, *44*, 1-14.

Meyer, A., Proudfit, G. H., Bufferd, S. J., Kujawa, A. J., Laptook, R. S., Torpey, D. C., & Klein, D. N. (2015). Self-reported and observed punitive parenting prospectively predicts increased error-related brain activity in six-year-old children. *Journal of Abnormal Child Psychology*, *43*, 821-829.

Michelson, D., Davenport, C., Dretzke, J., Barlow, J., & Day, C. (2013). Do evidence-based interventions work when tested in the "real world?" A systematic review and meta-analysis of parent management training for the treatment of child disruptive behavior. *Clinical Child and Family Psychology Review*, *16*, 18-34.

Mullahy, J. (1986). Specification and testing of some modified count data models. *Journal of Econometrics*, *33*, 341-365.

Muthén, L. K., & Muthén, B. O. (1998-2017). *Mplus user's guide* (8th ed.). Los Angeles, CA: Author.

Nix, R. L., Bierman, K. L., & McMahon, R. J. (2009). How attendance and quality of participation affect treatment response to parent management training. *Journal of Consulting and Clinical Psychology*, *77*, 429-438.

Panter-Brick, C., Burgess, A., Eggerman, M., McAllister, F., Pruett, K., & Leckman, J. F. (2014). Practitioner review: Engaging fathers-Recommendations for a game change in parenting interventions based on a systematic review of the global evidence. *Journal of Child Psychology and Psychiatry, 55,* 1187–1212.

Patterson, G. R. (2005). The next generation of PMTO models. *The Behavior Therapist*, *28*(2), 25-32.

Patterson, G. R., DeBaryshe, B. D., & Ramsey, E. (1990). A developmental perspective on antisocial behavior. *American Psychologist*, *44*(2), 329-335. doi:10.1037//0003-066X.44.2.329

Pew Research Center (2015).*6 facts about American dads.* Retrieved from http://www.pewresearch.org/fact-tank/2017/06/15/fathers-day-facts/#

Piehler, T. F., Ausherbauer, K., Gewirtz, A., & Gliske, K. (2016). Improving child peer adjustment in military families through parent training: the mediational role of parental locus of control. *The Journal of Early Adolescence*. Advanced online publication.

Pinna, K. L., Hanson, S., Zhang, N., & Gewirtz, A. H. (2017). Fostering resilience in National Guard and Reserve families: A contextual adaptation of an evidence-based parenting program. *American Journal of Orthopsychiatry*, *87*, 185-193.

Piotrowska, P. J., Tully, L. A., Lenroot, R., Kimonis, E., Hawes, D., Moul, C., ... & Dadds, M. R. (2017). Mothers, fathers, and parental systems: A conceptual model of parental engagement in programmes for child mental health—Connect, Attend, Participate, Enact (CAPE). *Clinical Child and Family Psychology Review*, *20*, 146-161.

Radey, M., & Randolph, K. A. (2009). Parenting sources: How do parents differ in their efforts to learn about parenting? *Family Relations*, *58*, 536-548.

Ramchandani, P. G., Domoney, J., Sethna, V., Psychogiou, L., Vlachos, H., & Murray, L. (2013). Do early father–infant interactions predict the onset of externalising behaviours in young children? Findings from a longitudinal cohort study. *Journal of Child Psychology and Psychiatry*, *54*, 56-64.

Ramchandani, P., Stein, A., Evans, J., O'Connor, T. G., & ALSPAC Study Team. (2005). Paternal depression in the postnatal period and child development: a prospective population study. *The Lancet, 365*, 2201-2205.

Reed, S. C., Bell, J. F., & Edwards, T. C. (2011). Adolescent well-being in Washington state military families. *American Journal of Public Health, 101*, 1676-1682.

Reid, M. J., Webster-Stratton, C., & Baydar, N. (2004). Halting the development of conduct problems in Head Start children: The effects of parent training. *Journal of Clinical Child and Adolescent Psychology, 33*, 279-291.

Reyno, S. M., & McGrath, P. J. (2006). Predictors of parent training efficacy for child externalizing behavior problems–a meta-analytic review. *Journal of Child Psychology and Psychiatry, 47*, 99-111.

Reynolds, C. R., & Kamphaus, R. W. (2004). *BASC-2: Behavior assessment system for children*. John Wiley & Sons, Inc.

Rose, C. E., Martin, S. W., Wannemuehler, K. A., & Plikaytis, B. D. (2006). On the use of zero-inflated and hurdle models for modeling vaccine adverse event count data. *Journal of Biopharmaceutical Statistics, 16*, 463-481.

Sanders, M.R., Bor, W., & Morawska, A. (2007). Maintenance of treatment gains: A comparison of enhanced, standard, and self-directed Triple P-Positive Parenting Program. *Journal of Abnormal Child Psychology, 35*, 983-998.

Sandler, I. N., Schoenfelder, E. N., Wolchik, S. A., & MacKinnon, D. P. (2011). Long-term impact of prevention programs to promote effective parenting: Lasting effects but uncertain processes. *Annual Review of Psychology, 62*, 299-329.

Sarkadi, A., Kristiansson, R., Oberklaid, F., & Bremberg, S. (2008). Fathers' involvement and children's developmental outcomes: a systematic review of longitudinal studies. *Acta Paediatrica, 97*, 153-158.

Sawrikar, V., & Dadds, M. (2018). What Role for Parental Attributions in Parenting Interventions for Child Conduct Problems? Advances from Research into Practice. *Clinical Child and Family Psychology Review, 21*, 41-56.

Schafer, J. L., & Graham, J. W. (2002). Missing data: our view of the state of the art. *Psychological Methods, 7*, 147-177.

Schock, A. M. & Gavazzi, S. M. (2004). A multimethod study of father participation in family-based programming. In Day, R. D. & Lamb, M. E. (Eds). Conceptualizing and measuring father involvement. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Schoenfelder, E. N., Sandler, I. N., Millsap, R. E., Wolchik, S. A., Berkel, C., & Ayers, T. S. (2013). Caregiver responsiveness to the Family Bereavement Program: What predicts responsiveness? What does responsiveness predict? *Prevention Science, 14*, 545-556.

Schoppe-Sullivan, S. J., Weldon, A. H., Claire Cook, J., Davis, E. F., & Buckley, C. K. (2009). Coparenting behavior moderates longitudinal relations between effortful control and preschool children's externalizing behavior. *Journal of Child Psychology and Psychiatry, 50*, 698-706.

Schultz, B. K., Evans, S. W., Langberg, J. M., & Schoemann, A. M. (2017). Outcomes for adolescents who comply with long-term psychosocial treatment for ADHD. *Journal of Consulting and Clinical Psychology, 85*, 250.

Scott, S., O'Connor, T. G., Futh, A., Matias, C., Price, J., & Doolan, M. (2010). Impact of a parenting program in a high-risk, multi-ethnic community: the PALS trial. *Journal of Child Psychology and Psychiatry*, *51*, 1331-1341.

Scourfield, J., Cheung, S. Y., & Macdonald, G. (2014). Working with fathers to improve children's well-being: Results of a survey exploring service provision and intervention approach in the UK. *Children and Youth Services Review, 43*, 40–50. doi:10.1016/j. childyouth.2014.04.009.

Shelleby, E. C., & Shaw, D. S. (2014). Outcomes of parenting interventions for child conduct problems: A review of differential effectiveness. *Child Psychiatry & Human Development*, *45*, 628-645.

Spoth, R. (2008). Translating family-focused prevention science into effective practice: Toward a translational impact paradigm. *Current Directions in Psychological Science*, *17*, 415-421.

Thomas, R., & Zimmer-Gembeck, M. J. (2007). Behavioral outcomes of parent-child interaction therapy and Triple P—Positive Parenting Program: A review and meta-analysis. *Journal of Abnormal Child Psychology*, *35*, 475-495.

Véronneau, M. H., Dishion, T. J., Connell, A. M., & Kavanagh, K. (2016). A randomized, controlled trial of the family check-up model in public secondary schools: Examining links between parent engagement and substance use progressions from early adolescence to adulthood. *Journal of Consulting and Clinical Psychology*, *84*, 526-543.

Walsh, T. B., Dayton, C. J., Erwin, M. S., Muzik, M., Busuito, A., & Rosenblum, K. L. (2014). Fathering after military deployment: Parenting challenges and goals of fathers of young children. *Health & Social Work, 39,* 35-44.

Willerton, E., Schwarz, R. L., Wadsworth, S. M. M., & Oglesby, M. S. (2011). Military fathers' perspectives on involvement. *Journal of Family Psychology, 25*, 521-530.

Winslow, E. B., Bonds, D., Wolchik, S., Sandler, I., & Braver, S. (2009). Predictors of enrollment and retention in a preventive parenting intervention for divorced families. *The Journal of Primary Prevention*, *30*, 151-172.